

CHIA---WEST RIDGE MINE

I. INTRODUCTION

The West Ridge Mine is located approximately 25 miles east of Price, Utah in the Book Cliffs Coal Field (Figure 1). The Book Cliffs form a rugged escarpment that faces to the south and southwest and separates the Uintah Basin from the San Rafael Swell. Elevations along the Book Cliffs range from approximately 5,000 to 10,000 feet. Steep, narrow canyons and high peaks are characteristic. Because of the rugged topography land uses are generally limited to wildlife habitat, rangeland, and recreation, but timber is harvested in some areas. A large portion of the surface area is public land managed by the Bureau of Land Management (BLM).

The Book Cliffs area may be classified as mid-latitude steppe to semi-arid desert. The climate is characterized by warm, moist springs and summers and by cold, dry winters. Precipitation varies from 20 inches at the highest elevations to 8 inches along the Price River downstream of the town of Wellington. Mean annual precipitation is about 12 inches, with most precipitation occurring during the late summer and early fall. Temperatures range from summer highs in the 90's to below zero during the winter months.

Vegetation varies from the sagebrush/grass community type at lower elevations to the Douglas fir/aspen community at higher elevations. Other vegetative communities include mountain brush, pinyon-juniper, pinyon-juniper/sagebrush, Douglas fir/maple, Douglas fir/rocky mountain juniper, aspen, and riparian. These communities are primarily used for wildlife habitat and livestock grazing. Habitat types in the canyons range from mixed mountain conifer on north- and east-facing slopes to pinyon-juniper woodland on south- and west-facing slopes. Cliff-forming rock outcrops have little or no vegetation. The Douglas fir/maple community is found primarily in the drainage bottoms, and pinyon-juniper woodland interspersed with patches of sagebrush shrub land occurs at the mouths of the canyons. On ridges above the canyons mixed mountain brush and sagebrush/grass dominate but there is some extensive aspen woodland. An area of pinyon-juniper adjacent to the mouth of B and C Canyons was chained in the late 1960's, but the trees have regrown (Chapter 3 of the West Ridge MRP).

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Book Cliffs Coal Field

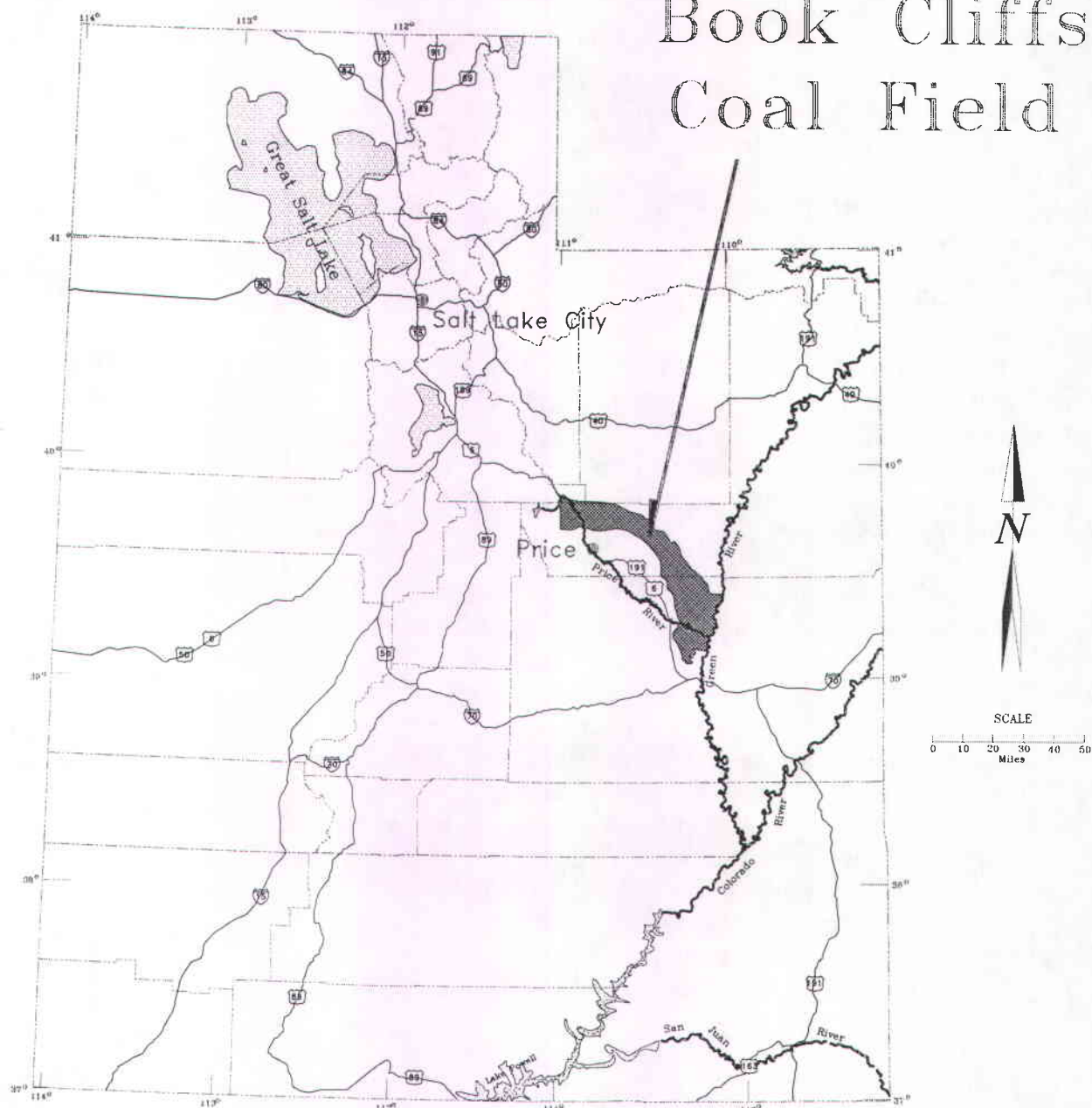


Figure 1- Location of Book Cliffs Coal Filed in Utah

Outcropping rocks of the Book Cliffs range from Upper Cretaceous to Quaternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) on the valley floor and at the base of the cliffs, up through littoral and lagoonal (Star Point Sandstone and lower Blackhawk Formation), to fluvial (upper Blackhawk Formation, Castlegate Sandstone, Price River Formation and North Horn Formation), and lacustrine (Flagstaff Formation and Green River Formation) depositional environments. The Colton Formation is a fluvial-deltaic sequence separating the Flagstaff and Green River deposits. Oscillating depositional

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CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

West Ridge Resources Incorporated
West Ridge Mine
C/007/041

Carbon County, Utah

February 12, 2002

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environments within the overall regressive Cretaceous trend are represented by members of the Blackhawk Formation, which is the major coal-bearing unit within the Book Cliffs Coal Field. The Star Point Sandstone thins eastward and pinches out in the vicinity of the Dugout Canyon Mine so it is not present in the West Ridge area.

Surface runoff from the Book Cliffs flows into the Price River drainage basin of south-central Utah (Figure 2). Headwaters of the Price River are the drainages around Scofield Reservoir and Soldier Summit. The river flows southeasterly and joins the Green River approximately 15 miles north of the town of Green River, Utah. Water quality is good in the mountainous headwater tributaries, but deteriorates rapidly after the river leaves Price Canyon and flows across the Mancos Shale. The Mancos typically has low permeability, is easily eroded, and contains large quantities of soluble salts. Total dissolved solids (TDS) levels of 3,000 mg/L and sulfate concentrations over 1,000 mg/L are not uncommon in the lower reaches of the Price River.

This Cumulative Hydrologic Impact Assessment (CHIA) is a findings document involving an assessment of the cumulative impact of all anticipated coal mining operations on the hydrologic balance within the Cumulative Impact Area (CIA). The only currently anticipated coal mining operation is the West Ridge Mine. West Ridge Resources had a Lease by Application (LBA) pending on federal coal lease UTU-76577; that lease transferred to SITLA in January 1999 and is identified on West Ridge Resources maps as the SITLA Exchange Area. It is anticipated that the SITLA Exchange Area will be added to the West Ridge Mine. West Ridge Resources intends to mine adjacent state and federal coal located northeast of the proposed permit area and has an option agreement with SITLA for rights to mine coal on Section 2, T. 14 S. R. 13 E. and the sw1/4, Section 36, T. 13 S., R. 13 E., but otherwise has not yet acquired rights to coal in these additional areas (Map 5-4a of the West Ridge Mine PAP).

In December 2001, West Ridge Resources acquired a Lease by Application (LBA) on federal coal lease UTU-78562. This expanded the West Ridge lease to include all of Sections 12 and 13, and the majority of Section 10 in T14S., R13E., respectively. It also includes portions of Sections 6, 7, and 18 in T14S, R14E, and portions of Section 35, T13S, R13E.

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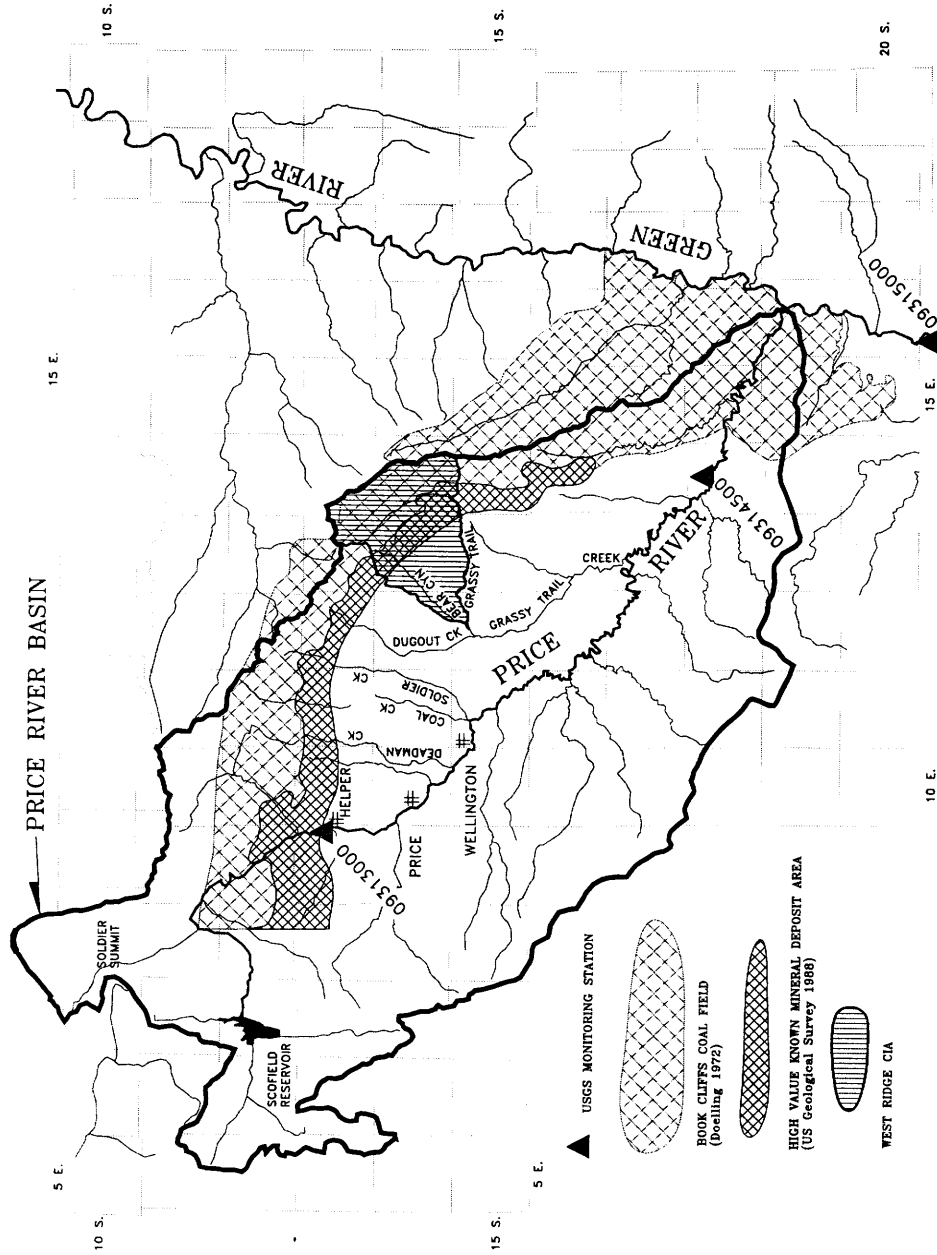


Figure 2- Book Cliffs Coal Field and Price River Basin

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The CHIA is not a determination if coal mining operations are each designed to prevent material damage beyond their respective permit boundaries when considered individually, but rather is a determination if there will be material damage resulting from effects that become cumulative outside the individual permit boundaries. This report complies with federal legislation passed under the Surface Mining Control and Reclamation Act (SMCRA) and subsequent Utah and federal regulatory programs under R645-301-729 and 30 CFR 784.14(f), respectively.

The objectives of a CHIA document are to:

1. Identify the Cumulative Impact Area (CIA). (Part II)
2. Describe the hydrologic system - including geology, identify hydrologic resources and uses, and document baseline conditions of surface and ground water quality and quantity (Part III)
3. Identify hydrologic concerns. (Part IV)
4. Identify relevant standards against which predicted impacts can be compared. (Part V)
5. Estimate probable future impacts of mining activity with respect to the parameters identified in 4. (Part VI)
6. Assess probable material damage. (Part VII)
7. Make a statement of findings. (Part VIII)

A CHIA was prepared in 1985 for the Sunnyside Mines, which were permitted by Kaiser Coal Corporation. The West Ridge Mine permit area corresponds roughly with Sunnyside's proposed B Canyon and C Canyon permit areas that were included in that 1985 CHIA. Operations at the Sunnyside Mines ceased in 1994 and the mine site completed final reclamation in 2000 by UDOGM.

II. CUMULATIVE IMPACT AREA (CIA)

The West Ridge Mine Cumulative Impact Area (CIA) is shown on Plate 1 and Figures 2 and 3. The CIA is the area within which actual and anticipated coal mining activities may interact to affect the surface and ground water. The CIA is determined based on anticipated mining activities, knowledge of surface and ground water resources, and anticipated impacts of mining on those water resources.

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The West Ridge Mine CIA encompasses roughly 56,000 acres (88 mile²). It includes federal coal lease SL-068754 (approximately 2,571 acres), an 80-acre lease modification to SL-068754 in 1998, and federal coal lease UTU-78562 (approximately 1,646 acres) totaling 4,297 acres, which is the currently proposed West Ridge Mine permit area. The CIA also includes federal coal lease UTU-76577 on which West Ridge Resources had a Lease by Amendment (LBA) pending; that lease transferred to SITLA in January 1999 and is identified on West Ridge Resources maps as the SITLA Exchange Area. The CIA also includes Section 2, T. 14 S. R. 13 E. and the sw¹/₄, Section 36, T. 13 S., R. 13 E. on which West Ridge Resources has an option agreement with SITLA for rights to mine coal. West Ridge Resources has not yet acquired rights to mine the coal on additional adjacent state and federal lands located northeast of the proposed permit area, but future mining is being planned for that area (Map 5-4a of the West Ridge Mine PAP) so it is included in the CIA. West Ridge Resources also has a long term special use permit from the State of Utah, Utah School and Institutional Trust Lands Administration (SITLA) for a substitute topsoil borrow area within the SE 1/4 of section 16, T 14 S, R 13 E.

Whitmore Canyon is the major surface drainage in the CIA. A, B, C, and Bear Canyons are intermittent drainages cut into the face of the Book Cliffs escarpment.

SCOPE OF MINING

Sunnyside Mines

Mining at the Sunnyside properties was initiated during the late 1890's. Total coal production has exceeded 55 million tons. Kaiser Steel Corporation acquired the Sunnyside properties in 1950 and operated the mines until April 1985. Kaiser Coal Corporation operated the mines from 1985 until 1994, when operations ceased and Kaiser Coal declared bankruptcy.

Plate 1 shows the extent of Kaiser Coal Corporation's Sunnyside operations that included, from south to north, the No. 2 Mine, No. 3 Mine and No. 1 Mine. The three mines encompassed the southern three-quarters of the Sunnyside permit area. Future mining was projected to the northwest and would have included the B Canyon and C Canyon areas.

Sunnyside Mines workings are approximately 6.5 miles in length and extend a maximum of 2.5 miles down-dip to the east. The first 5 year permit area encompassed 14,300 acres. Overburden thickness was approximately 1,000 feet to 2,000 feet.

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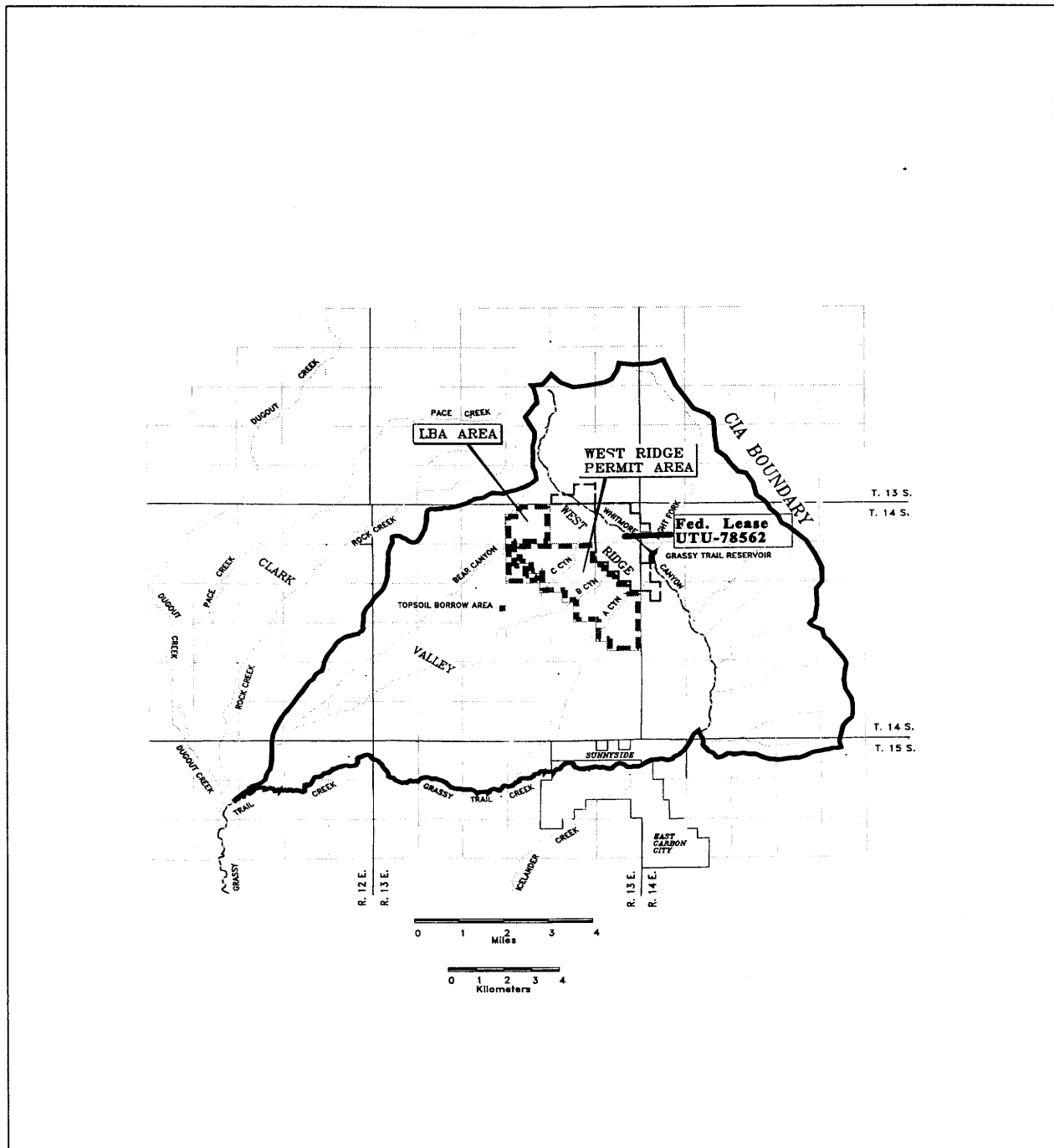


Figure 3- Cumulative Impact Area (CIA)

Mining was done in the Upper Sunnyside coal seam in the No. 3 Mine and Lower Sunnyside coal seam in the No. 1 Mine and No. 2 Mine. Sixty-five to 80 % of the coal was to be produced by longwall mining methods, with the remaining production from continuous miner entry development and pillaring in areas unsuitable for longwall methods.

B Canyon

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B Canyon is located northwest of the old Sunnyside No. 1 underground mine workings. Federal coal lease SL-068754, the West Ridge Mine coal tract, was at one time held by U.S. Steel Corp. U.S. Steel authorized Kaiser Coal Company to extend a set of test entries from the Sunnyside Mine part way through the lease. In 1959 and 1960 Kaiser Coal mined two entries 11,000 feet northwestward, along the strike of the Lower Sunnyside seam, into the center of lease (SL-068754). From these main entries another entry was developed up-dip, to the west, for approximately 2,000 feet before it broke out in B Canyon. This breakout was utilized as an intake air portal until 1991 when it was sealed and backfilled. The Sunnyside Mine test entries are now inactive and sealed to prevent public access. Only development work was performed, no pillars were pulled.

The location of the old workings with respect to the proposed West Ridge Mine is shown on Plate 1. The land use in B Canyon prior to portal development was wildlife habitat, grazing and coal exploration and mining.

C Canyon

C Canyon is located approximately 1 mile northwest of B Canyon. The proposed surface facilities for the West Ridge Mine are to be situated in C Canyon, north of the old underground mine workings of the Sunnyside No. 1 Mine.

In the mid-1950's the road along the bottom of C Canyon was constructed to a drill site in the right fork. The road was improved again in 1985 to facilitate drilling equipment for a water monitoring drill hole in the right fork.

Another road leads up the left fork to the coal outcrop. The Lower Sunnyside seam was exposed and coal removed for testing purposes, probably using hand tools or a loader. The size of the excavation indicates less than 1 ton of coal was removed. This coal outcrop excavation was done sometime in the late 1960's or early 1970's.

Land use is wildlife habitat, grazing, and coal exploration and mining. Proposed post-mining land use is wildlife habitat, grazing, and recreation.

In the proposed West Ridge Mine only the Rock Canyon and Gilson seams appear sufficiently developed to be mined under current conditions. Although both seams have been previously mined in Dugout Canyon, the current permit application is for mining in the Rock Canyon seam only. Projected mining in the West Ridge Mine will extend approximately 3 miles southeast-to-northwest and up to 1.5 miles southwest-to-northeast. There appears to be sufficient coal to anticipate extending the workings up to 2 miles east of the currently proposed permit area into federal lease U-07064-027821, but such an eastward extension is not part of the current (1998) West Ridge Mine permit application.

III. HYDROLOGIC SYSTEM and BASELINE CONDITIONS

Elevations range from approximately 6,000 to over 9,000 feet in the CIA. Predominant features that exist in the West Ridge CIA are cliffs, narrow canyons, valleys and pediments. Drainage in the CIA is characterized by a system of intermittent streams draining the southwest-facing Book Cliffs escarpment and a perennial stream that drains to the southeast through Whitmore Canyon.

GEOLOGY

Stratigraphy

The stratigraphy of the West Ridge CIA consists of strata ranging in age from Late Cretaceous to Tertiary (Eocene) as seen in Figure 4. There are no major disconformities in the area. The oldest exposed rocks include the upper members of the Mancos Shale. The Cretaceous Mesaverde Group, which in the Book Cliffs consists of the Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone and Price River Formation, overlies the Mancos Shale. Overlying the Mesaverde Group are the North Horn Formation, Flagstaff Limestone, Colton Formation, and Green River Formation, which in the Book Cliffs constitute the Wasatch Group of Paleocene to Eocene age. The Eocene Green River Formation is the uppermost consolidated formation in the CIA. Unconsolidated deposits formed by weathering and erosion exist as soils, terrace deposits, gravels along canyon streams, and pediments at the base of escarpments.

Coal

In the West Ridge and C Canyon area, the four lowest coal seams or zones in the Blackhawk Formation are not mineable because the coal deposits are thin and of limited extent. The lowest seam, the Kenilworth, rests directly or just above the massive Kenilworth Sandstone Member of the Blackhawk Formation. Thickness averages 2 feet along the outcrop and does not exceed 4 feet anywhere on the West Ridge property. About 20 to 30 feet above the Kenilworth seam is the Gilson coal horizon. Thicknesses in the range of 12 feet have been measured in the vicinity of Pace Canyon, but the Gilson seam splits and thins to the southeast and at Whitmore Canyon the coal has been replaced by marine sands. Over the northern portion of the West Ridge lease area the main Gilson bed is less than 2 feet. The Fish Creek coal horizon lies about 15 to 25 feet above the Gilson seam, but coal thickness averages only 1 to 2 feet in the West Ridge lease area. About 55 to 70 feet above the Gilson seam is the Rock Canyon coal zone, but it does not contain a developed coal seam in the West Ridge lease area.

The principal coal-bearing horizon beneath the West Ridge Mine permit area is the Sunnyside coal zone. This zone begins 125 feet above the Rock Canyon horizon and ends 200 to 275 feet below the Castlegate Sandstone. This zone varies between several feet to more than 60 feet in thickness. Within this zone nine coal beds were identified in the Sunnyside Mines. The

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bottom three beds have been assigned to the Lower Sunnyside Seam and the remainder to the Upper Sunnyside Seam.

The Lower Sunnyside Seam is the most important coal seam in the West Ridge area. To the north and west of C Canyon the Lower Sunnyside seam occurs as a single seam. Thickness exceeds 6 feet throughout most of the lease area, but thins to the south and east where one or two rider seams are present above the main coal seam. Neither rider seam reaches mineable thickness, but to the south, in the vicinity of the Sunnyside Mines, the rider seams combine with the Upper Sunnyside to form a single seam 10 to 15 feet thick. Throughout the lease area the Lower Sunnyside Seam has a sandstone floor and the roof is composed of either a black sandy shale or a fine grained sandstone with shale partings.

The Upper Sunnyside Seam is the least defined of the coal horizons. Its six beds tend to be lenticular and correlation between widely spaced data points is difficult. Overall thickness is from 2 to 15 feet in the Sunnyside Mines. In the West Ridge lease area the average seam height is less than 4 feet. Because of its thinness and close proximity to the Lower Sunnyside Seam, none of the Upper Sunnyside is considered to be mineable at West Ridge.

Maximum overburden depth exceeds 2,500 feet for the Lower Sunnyside seam. The average overburden under the West Ridge permit area is approximately 1,500 feet (West Ridge Mine MRP).

Structure

Strata in the Book Cliffs were tilted in response to the rise of the San Rafael Swell and Socally and Farnam anticlines, and modified by subsequent erosional, tectonic and orogenic events. Strike of the beds at the West Ridge Mine site is northwest-southeast, generally parallel to the face of the Book Cliffs. Dip is 7 degrees to the northeast in the West Ridge Mine area; however dips in the area are often as much as 19 degrees in places along the Book Cliffs escarpment, and decrease to as little as 4 degrees several miles back from the escarpment, such as in the deeper parts of the Sunnyside No. 1 Mine and at outcrops in upper Whitmore Canyon (Osterwald and others, 1981). This appears to be the result of elastic rebound of the Mancos Shale as overlying material has been removed by erosion (Duguid, 1981).

Joints occur in two principal and two secondary orientations, although orientations are more accurately related to the local strike of the strata rather than to a specific direction. All joints tend to dip steeply. Retreat of the Book Cliffs escarpment has probably been facilitated significantly by blocks of rock breaking from the cliffs along joints, and soils and vegetative cover develop in large troughs formed as these blocks pull away. Northwest to north-northwest joints tend to be the most variable in orientation. They generally are parallel to strike of the strata and at right angles to the canyons and ridges of the escarpment. Locally they occur as little as 1 foot apart in zones a few feet wide, zones being a few feet to 20 feet apart. There has been vertical movement on some of these joints and some are coated with gypsum or calcite. Northeast to north-northeast joints are generally normal to the northwest to north-northwest joints and tend to be parallel to dip. There are also west-northwest and northeast trending joint sets (Osterwald and others, 1981).

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There are few faults mapped in the CIA and faulting does not seem to be an important factor in the geology or hydrology of this particular area. The Sunnyside fault is a major north-northwest striking fault throughout much of the Sunnyside Mining District to the south (Osterwald and others, 1981). Displacement on this fault decreases northward, and although this fault is detectable from surface mapping in Whitmore Canyon, it does not appear to extend as far as the West Ridge mine permit area. Two small faults have been mapped just to the northeast of the West Ridge mine area (Map 6-1 of the West Ridge MRP). Maps done by the Utah Geological Survey (Doelling, 1972) indicate at least two other faults that strike approximately northwest-southeast in the area of Bear, C, and B Canyons, but 1997 field work by Agapito Associates, Inc. for the West Ridge Mine permit application did not locate faults in this area.

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System	Series	Stratigraphic unit		Thickness (feet)	Description
TERTIARY	Eocene	Green River Formation		-	Greenish gray and white claystone and shale, also contains fine-grained and thin-bedded sandstone. Shales often dark brown containing carbonaceous matter. Full thickness not exposed.
		Colton Formation	Wasatch Formation	300-2,000	Colton consists of brown to dark red lenticular sandstone, shale and siltstone, thins westwardly and considered a tongue of the Wasatch.
				3,000	Wasatch predominantly sandstone with interbedded red and green shales with basal conglomerate. Found in east part of field and equivalent to Colton and Flagstaff in west.
		Paleocene	Flagstaff Limestone		0- 500
CRETACEOUS	Danian	North Horn Formation		350-2,500	Gray to gray green calcareous and silty shale, tan to yellow-gray fine-grained sandstone and minor conglomerate. Unit thickens to west.
		MINOR COAL			Light gray to cream-white friable massive sandstone and subordinate buff to gray shale that exhibits light greenish cast. Contains minor conglomerate and probably represents lower part of North Horn, only present in east part of field.
	Maestrichthian	Tuscher Formation		0- 200	
		Campanian	Mesaverde Group	Price River Formation MINOR COAL	500-1,500
	Castlegate Sandstone MINOR COAL			100- 500	White to gray, fine- to medium-grained, argillaceous massive resistant sandstone thinning eastwardly with subordinate shale. Carbonaceous east of Horse Canyon but coal is thin and lignitic.
	Blackhawk Formation MAJOR COAL SEAMS			600-1,100	Cyclical littoral and lagoonal deposits with six major cycles. Littoral deposits mainly thick-bedded to massive cliff-forming yellow-gray fine- to medium-grained sandstone, individual beds separated by gray shale. Lagoonal facies consist of thin- to thick-bedded yellow-gray sandstones, shaley sandstones, shale and coal. Coal beds form basis of Book Cliffs coal field. Unit thins eastward grading into the Mancos Shale.
	Star Point Sandstone			0- 580	Yellow-gray massive medium- to fine-grained littoral sandstone tongues projecting easterly separated by gray marine shale tongues projecting westerly.
	Masuk Tongue			4,300-5,050	Gray marine shale, locally heavily charged with carbonaceous material, slightly calcareous and gypsiferous, nonresistant forming flat desert surfaces and rounded hills and badlands. Separated mainly to the west into tongues by westward projecting littoral sandstone which eventually grade into shale. Sandstones are fine- to medium-grained, yellow-gray to tan and medium-bedded to massive and cliff forming.
	Emery Sandstone				
	Garley Canyon Sandstone				
	Blue Gate Shale				
	Ferron Sandstone MINOR COAL				
	Tununk Shale				
	Dakota Sandstone	2- 126	Heterogeneous sandstone, conglomerate and shale, thin resistant cuesta former.		

Figure 4 - General Stratigraphy of the Book Cliffs Coal Field

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HYDROLOGY

Ground water

In the CIA, the Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone and Quaternary deposits all contain potential reservoirs or conduits for ground water. Reservoir lithologies are predominately sandstone and limestone. Sandstone reservoirs occur where there is sufficient intergranular porosity and permeability in lenticular fluvial-channel and tabular overbank deposits, whereas limestone reservoirs have developed through dissolution and fracturing of tabular lacustrine deposits. Shale, siltstone, and cemented sandstone beds act as aquatards or aquacludes to impede ground-water movement. The Mancos Shale is a regional aquaclude that limits downward flow. More localized aquatards occur within the North Horn, Price River, Castlegate and Blackhawk Formations. Ground water in the CIA, as is typical of ground water throughout the Price River basin, occurs under both confined and unconfined conditions.

Recharge in the Wasatch Plateau and Book Cliffs coal fields has been estimated to be 3 to 8 % (Danielson and Sylla, 1983) and 9 % (Waddell and others, 1986) of the average annual precipitation. Snowmelt provides most of the ground-water recharge. In the Book Cliffs the recharge rate is generally greatest where limestones of the Flagstaff Formation are exposed as dip-slopes at the higher elevations, but the Flagstaff is thin in the West Ridge CIA and is not exposed on dip slopes (Plate 2 in Osterwald and others, 1981).

Once recharge enters the ground, the rate and direction of ground-water flow is governed mainly by gravity and geology. Lateral ground-water flow dominates in the gently-dipping Tertiary and Cretaceous strata of the Book Cliffs, where layers of low-permeability rock that impede downward movement are common. Both lateral and vertical flow may be channeled through faults and fractures, but plastic or swelling clays that can seal faults and fractures are abundant. Typically ground-water flow in the Book Cliffs continues both laterally and downward until it intercepts the surface and is discharged as a spring or seep, enters a stream as baseflow, is transpired by vegetation, or simply evaporates. Ground water tends to flow more readily through shallower systems because the hydraulic conductivities are commonly larger than those of deeper systems, but some of the ground water will follow slower, deeper flow-paths.

Generally springs in the Book Cliffs and Wasatch Plateau coal fields are associated with contacts between zones or strata of differing permeability, such as at the base of sandstone lenses in the Colton and Green River Formations or limestone beds in the Flagstaff and North Horn Formations (Osterwald and others, 1981). In many areas, such as the Soldier and Dugout Canyon area several miles to the northwest, the contact between the Flagstaff Limestone and the North Horn Formation is the preferred location for springs; however, in the West Ridge CIA there are only a few springs at this contact because the Flagstaff Formation is thin or absent and the contact between the Flagstaff and North Horn Formations is transitional (Osterwald and others, 1981), and in addition the overlying Colton Formation is relatively thick.

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Springs or areas of multiple springs are or have been monitored within the West Ridge CIA by West Ridge Resources, Inc. and its predecessors. In the fall of 1985 and spring of 1986 a seep and spring survey was done on West Ridge by Kaiser Coal Corporation to evaluate the density, or spatial distribution, of springs between a mined-out area and an area that had not been mined. Approximately 150 seeps and springs were identified (West Ridge Mine MRP, Appendix 7-1). Additional data on some of the springs in the 1985-86 survey were collected by Kaiser Coal Company in 1988 and 1989.

The seep and spring density was found to be roughly the same in both areas: the mined out area had a density of 21.1 springs and seeps per square mile producing an average of 74.8 gpm/sq mi compared with 22.4 springs and seeps per square mile in the unmined area, producing an average of 79.3 gpm/sq mi. This information indicates that subsidence from mining in the existing Sunnyside Mines had produced no quantifiable difference in flow of seeps and springs on the west side of Whitmore Canyon.

In the CIA the large majority of the seeps and springs occur in Whitmore Canyon where they issue from the Colton Formation and alluvium and colluvium (Maps 6-1 and 7-5 and Figure 10 of the West Ridge MRP). The number of springs decreases rapidly downward through the stratigraphic section. Mayo and Associates (1998, p. 59) identified 83 springs issuing from the Colton, 29 from the North Horn, 11 from the Price River, and 1 from the Mancos. There were 29 from alluvium or colluvium, but none were identified as flowing from the Castlegate Sandstone or Blackhawk Formation. Several of the springs identified in the Kaiser surveys as discharging from the Castlegate Sandstone (S-40 and S-84) and Blackhawk Formations (S-2, S-20, S-62, and S-81) were grouped by Mayo and Associates with the alluvial and colluvial springs. Even if seeps and springs do not discharge from the Castlegate Sandstone and Blackhawk Formation in this area, there are permeable horizons in these units that contain ground water; the drillers log for DH86-2 shows ground water was encountered in the upper Blackhawk Formation during drilling (Mayo and Associates, 1998, p. 60), and the well is currently used to monitor ground water in the Sunnyside Sandstone Member.

The large alluvial fan at the mouth of Whitmore Canyon is a valuable source of water for the Sunnyside area. It is recharged from Grassy Trail Creek. Springs and wells in this fan provide water for irrigation, domestic and industrial uses, and livestock. With the addition of federal lease UTU-78562, stream sites ST-9 and ST-10 were added to the Operational Monitoring Plan to monitor any changes in the flow of Grassy Trail Creek above the Grassy Trail Reservoir. ST-9 is located at the inlet of Grassy Trail Reservoir and ST-10 is located at the northern boundary of the federal lease where it intersects Grassy Trail Creek. Spring S-80, located at the northern lease boundary where it crosses Hanging Rock Spring, was also added to the Operational Monitoring Plan.

Plate 1 shows locations for all springs, streams and surface water monitoring sites, bore holes, and ground-water monitoring wells. The inset detail provides identification of the sites used by West Ridge Resources for baseline and operational data.

Test holes were bored from the surface and from within Kaiser's exploratory entries. West Ridge Resources reported that the drill-hole logs contain no information about ground

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water encountered during drilling. It is unknown if water was not encountered or if ground water was simply not noted on the logs; however, ground water has been monitored in drill-holes DH 86-1 and DH 86-2, and DH 90-1 has been used as a water-supply well, so it is likely that ground water was encountered in other bore holes also.

Information on hydraulic conductivities in strata beneath or near the coal seams can be inferred from measurements done at the nearby Soldier Canyon Mine. Three bore holes were drilled from the Rock Canyon seam workings of the Soldier Canyon Mine down through the Gilson seam and a 13- to 20-foot thick, clean sandstone located approximately 40 to 50 feet below the Gilson seam. Hydraulic conductivities of 2×10^{-7} to 10^{-6} cm/sec were measured in two of the holes, but hydraulic conductivity was 1.5×10^{-3} cm/sec in the third. The tests measured the hydraulic conductivity of the entire stratigraphic sequence. Ground water was under confined and flowing conditions in all three bore holes. Even assuming the bore holes measured the hydraulic properties of the same stratigraphic sequence at the three different locations, the range of hydraulic conductivities shows great inhomogeneity and indicate that any potentiometric surfaces in strata beneath the coals are almost certainly not planar or of uniform dip. Information on these three bore holes, including driller's logs, is in Appendix 7-I of the Soldier Canyon Mine MRP.

Sunnyside City and East Carbon City have water right 91-4960 for 31.621 ac-ft/yr (19.6 gpm) from water-supply well DH 90-1 in the sw1/4 sw1/4 of Section 17, T. 14 S., R. 14 E. Information from the state engineers office in Price (Mark Page, Personal Communication to West Ridge Resources) indicates that the well has a total depth of 500 feet. The well has a gravel pack from 207 to 500 feet below ground surface. According to information from the Sunnyside Coal Company that is cited in the West Ridge Mine PAP, DH 90-1 is completed in the Price River and North Horn Formations. Because the well is located over a mile from the West Ridge Mine lease boundary, and is completed in the Price River and North Horn Formations, it is very unlikely that mining in the permit area will affect groundwater systems that contribute water to DH 90-1.

Most water entering mines in the Wasatch Plateau and Book Cliffs coal fields comes through leaks in the mine roof. Historic discharges from the nearby Soldier Canyon and Sunnyside Mines average about 300 to 400 gpm. Average annual flow into the Soldier Canyon Mine between 1988 and 1994 was approximately 420 gpm, and water not used in the mine or lost to evaporation is collected in an in-mine settling pond and discharged to Soldier Creek through a Utah Pollutant Discharge Elimination System (UPDES) permitted discharge point. Mine discharge rates in 1985 and from 1987 to 1996 varied from less than 100 gpm to over 700 gpm and averaged about 400 gpm. Both discharge rates and coal production increased slightly over the seven year period from 1987 to 1994; however changing water management practices and measurement errors rather than variations in flow into the mine could be contributing to or be entirely responsible for the variations observed.

Ground-water quality varies greatly, depending on geology, physiography, and elevation. Waddell and others (1986) indicate that TDS concentrations range from 250 to 2,000 mg/L in the Book Cliffs area. The best quality occurs in or near mountain recharge areas and the poorest quality in lowland areas. The chemical characteristics of the ground water vary vertically from

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formation-to-formation and areally within each formation. TDS in water from the Flagstaff Limestone ranges from 250 to 500 mg/L, whereas TDS in the Blackhawk and North Horn Formations range from 500 to 2,000 mg/L. The principal chemical constituents in Flagstaff water are calcium and bicarbonate. Water from the Blackhawk is of variable chemical composition with no single dominant cation or anion. Where dissolved solids concentrations from water in the Blackhawk are affected by the Mancos Shale, sulfates of sodium and magnesium increase significantly. Mundorff (1972) and Waddell and others (1986) reported that water from two springs that issue near the contact between the Blackhawk Formation and the Mancos Shale have specific conductances that indicate TDS concentrations of 1,600 and 2,000 mg/L, respectively.

Water samples collected from several locations inside the Sunnyside Mine, in particular sumps, consistently had TDS levels in excess of 1,200 mg/L. Many of the samples from areas other than sumps had better quality water with TDS levels between 400 to 800 mg/L, which is probably more representative of the ground water that was flowing into the mines. TDS levels in drill hole DH-86-1 were also in this 400 to 800 mg/L range, but 15 of 17 samples from DH-86-1 were above 1,200 mg/L TDS. Well DH-86-1 has not been monitored since August 1996. At that time, numerous attempts were made to monitor the well, but the well was blocked/breached at approximately 450-ft below the ground. The well is screen from the 575-657 foot level. Waters from springs SP-6, SP-8, and PC-1 also are high in TDS.

Saturation indexes indicate that most ground waters are at saturation with respect to calcite. Ground waters are generally undersaturated with respect to dolomite, gypsum, and anhydrite (Waddell and others, 1986).

Surface Water

The West Ridge CIA is situated in the Book Cliffs, about halfway between the headwaters of the Price River and its confluence with the Green River (Figure 2). Many streams that originate in the Book Cliffs are perennial at higher altitudes but become ephemeral as they emerge from the mountains and flow onto the lowlands (p. 7 in Waddell and others, 1981). The CIA is drained directly by Grassy Trail Creek through Whitmore Canyon (Figure 3 and Plate 1) and by several small ephemeral or intermittent creeks that drain the western face of West Ridge and flow westward toward lower Grassy Trail Creek. Grassy Trail Creek is perennial above and for a short reach below Grassy Trail Reservoir, but intermittent from the Sunnyside area to its confluence with the Price River. The Price River flows into the Green River about 40 miles southeast of the mines (Figure 2). The Green River flows southward from its confluence with the Price River approximately 75 miles until it discharges into the Colorado River (Figure 1).

Flow in the Price River is regulated at Scofield Reservoir, and discharge is measured at several locations both upstream and downstream of the confluences with Deadman, Coal, Soldier, and Grassy Trail Creeks (Figure 2). The area of the Price River drainage is 455 mile² above USGS gauging station 09313000 near Helper, and 1,540 mile² above USGS streamflow gauging station 09314500 near Woodside, about 10 miles below the confluence with Grassy Trail Creek. Between these two stations water is taken from the river and its tributaries for irrigation.

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As of 1997, USGS water discharge data are available for station 093143000 for water years 1934 to 1969, 1979 to 1981, and 1990 to 1996. Records are fair except for estimated daily discharges, which are poor.¹ Extreme flows recorded were 9,340 cfs on September 13, 1940 and 0.4 cfs on August 21, 1961. The mean annual flow volume for the three periods of record is 110 cfs or 80,000 ac-ft/year.

USGS water discharge data are available for station 09314500 for water years 1909 to 1911 and 1945 to 1992. Records are fair except for estimated daily discharges, which are poor. Maximum recorded discharge was 11,200 cfs on September 7, 1991. Periods of no flow were recorded in 1960, 1961, 1963, and 1992. The mean annual flow volume (1947 to 1992) was 121 cfs or 88,000 ac-ft/year. Limited water quality data are available for 1946 to 1949, 1951 to 1988, and 1991 to 1996 (Table 1).

Discharge of the Green River has been measured at USGS gauging station 09315000 at Green River, Utah, about 12 miles below the confluence of the Price and Green Rivers (Figure 2). For water years 1894 to 1899 and 1904 to 1996 flow ranged from a minimum of 255 cfs on November 26, 1931 to a maximum of 68,100 cfs on June 27, 1917. Average annual discharge is 6,192 cfs or 4,484,000 ac-ft/year. Records are good except for estimated daily discharges, which are poor. Water quality data are available for 1928 to 1996 (Table 1).

Snowmelt is the major source of water for the perennial streams of the Price River basin. Intermittent and ephemeral streams are abundant, existing primarily at lower elevations where potential evapotranspiration exceeds precipitation. Intense summer thunderstorms may cause short-term flooding but not large volumes of runoff.

Water use in the higher elevations of the Price River basin is primarily for wildlife and stock watering purposes. The upper watershed provides most of the domestic water needs for the lower valley. Within the lower valley area, agricultural activities utilize some of the water (Mundorff, 1972). Minimum flows in the gauged streams and rivers in the basin occasionally reach zero. Storage reservoirs are common at higher elevations.

In general the quality of water in the headwaters of the Price River basin is excellent. Waddell and others (1981) report that the Price River and its tributaries generally have a TDS concentration of between 250 to 500 mg/L upstream from Helper, and the water type in this area is calcium bicarbonate. However, the quality of water in the Price River rapidly deteriorates down gradient. Below the town of Helper most flows originate on Mancos Shale or are irrigation return flows from lands situated on Mancos-derived soils (Price and Waddell, 1973). The Price River near the confluence with Soldier Creek has an average TDS content of about

¹ "Good" means about 95 % of reported daily discharges are within 10 % of the actual discharge, "fair" means within 15 %, "poor" means reported values have less than "fair" accuracy. Accuracy is based on 1) the stability of the stage-discharge relationship or, if the control is unstable, the frequency of discharge measurements; and 2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

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1,700 mg/L, including sulfates of calcium, magnesium and sodium. At USGS station 09314500, the weighted average TDS content is between 2,000 and 4,000 mg/L, with the water type being strongly sodium sulfate (Mundorff, 1972).

Sediment yields from the upper portion of the Price River basin are small, with erosion rates varying from 0.1 to 0.5 ac-ft/mile²/yr. Lowest rates are from the higher parts of the Book Cliffs, where exposed rocks are dominantly limestone and dolomite. The bulk of the sediment in the Price River comes from the more erodible sandstones and shales that are common at lower elevations, where annual sediment yields of 0.5 to 3.0 ac-ft/mile²/yr are reported by Waddell and others (1981, Plate 6).

Surface Water Hydrology of the CIA

The West Ridge CIA covers approximately 31,000 acres of Whitmore Canyon and several small intermittent watersheds on the west side of West Ridge. Topography in the area is rugged, with elevations ranging from approximately 6,000 to over 9,000 feet. Slopes vary from vertical cliffs to less than 2 % along the ridges.

Water resources within or adjacent to the West Ridge CIA include a few low yielding springs and streams. There are no major water bodies located within or adjacent to the CIA.

Soil cover varies with slope, with bare sandstone cliffs along the upper portions of the canyons, shallow silty soils on the milder slopes, and shallow sand-gravel alluvium in the channel bottoms. The USDA soil survey for the Carbon area (USDA, 1988) indicates the soils along West Ridge are in hydrologic soils groups B to D, having infiltration rates that are moderate to very slow.

The estimated average annual sediment yield is 0.1 to 1.0 ac-ft/mile²/yr across the CIA. Generally, steep slopes and higher elevations are 0.1 to 0.2 ac-ft/mile²/yr while lower, flat areas developed on Mancos Shale are 0.5 to 1.0 ac-ft/mile²/yr (Waddell and others, 1981, Plate 6), so the estimated average annual sediment yield of the West Ridge CIA covers a broad range, 5 to 48 ac-ft/yr for undisturbed conditions.

Grassy Trail Creek

The headwaters of Grassy Trail Creek are in the area between the Book Cliffs and the Roan Cliffs in the north part of the West Ridge CIA (Plate 1), at altitudes ranging from approximately 7,000 to over 9,000. Whitmore Canyon, a steep, deep, narrow valley, has been eroded through Tertiary and Cretaceous strata. At the mouth of Whitmore Canyon, Grassy Trail Creek crosses a large alluvial fan then meanders across a gently sloping plain on the Mancos Shale to its confluence with the Price River. USGS monitoring station 09314340 (Plate 1) is located at an elevation of 6,600 feet, approximately half way between the town of Sunnyside and the Sunnyside Mine. According to Mundorff (1972), Grassy Trail Creek has the largest drainage area of any tributary to the Price River. The drainage area above station 09314340 is 40.1 miles² (USGS, 1998), and from topographic maps it can be determined that the length of the stream is approximately 10 miles and has a slope of roughly 230 feet/mile.

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The USGS measured discharge of Grassy Trail Creek for water years 1979 to 1985 at station 09314340 (USGS, 1998); record quality was good. Typically, most of the total flow in the Book Cliffs is from snowmelt but highest flows are from thundershowers. Grassy Trail Creek average daily mean discharge for the seven-year period was 9.9 cfs (Figure 5). Maximum daily mean flow was 349 cfs on May 28, 1983 and maximum measured flow was 631 cfs on May 31, 1983. Minimum daily mean flow was 0.04 cfs on February 22, 1981, and no flow was observed at some time during the day on several days in February 1981.

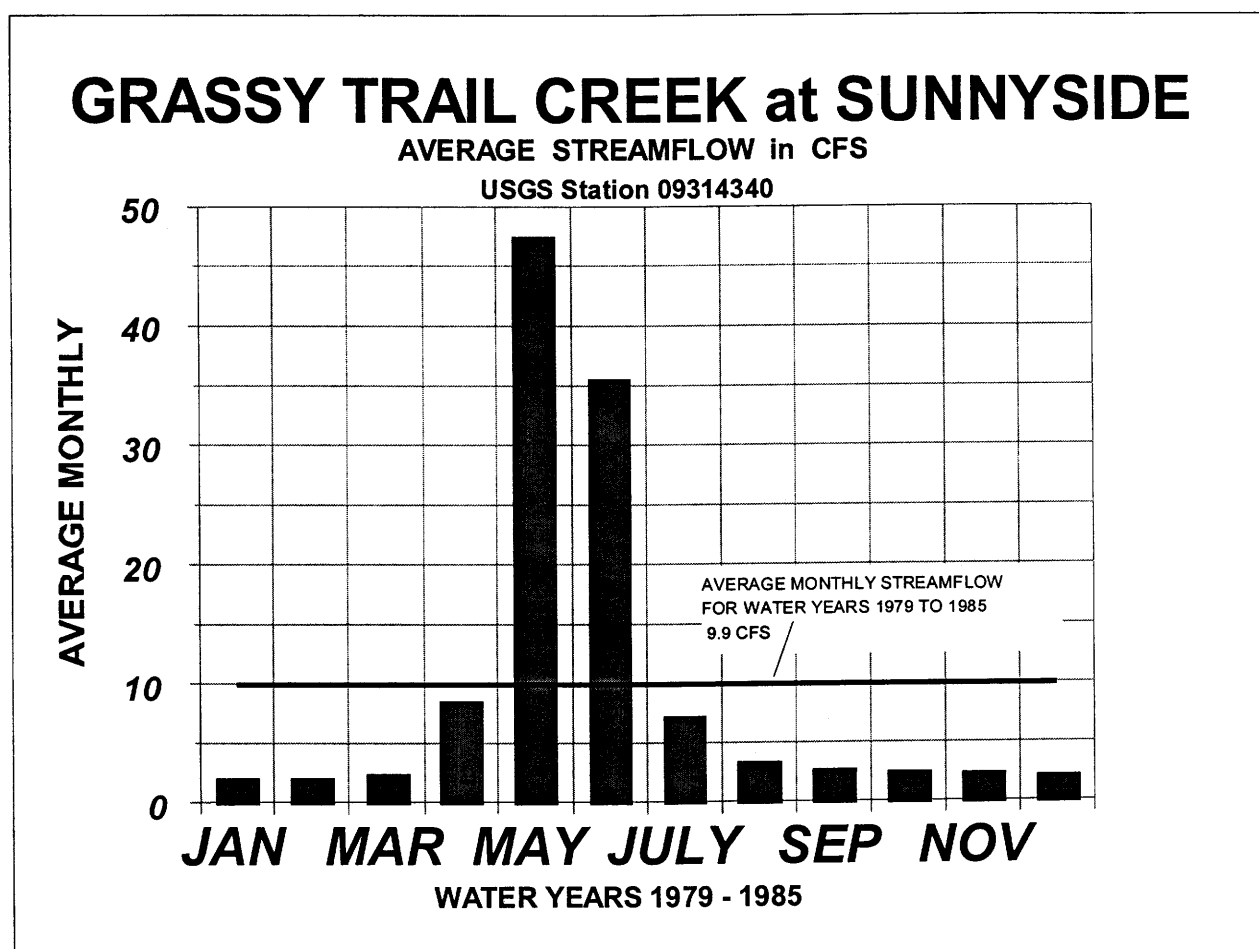


Figure 5- Grassy Trail Creek discharge at Sunnyside, Utah

Baseflow measurements (Price and Plantz, 1987) in water years 1979 to 1984 indicate that flow increases substantially between Grassy Trail Reservoir and station 09314340. Although much of the increase was attributed to discharges from the Sunnyside Mine, some was due to ground-water inflow from the Price River Formation and overlying strata.

Water quality was measured in up to 49 samples (not all samples were analyzed for all parameters) from station 09314340 during water years 1979 to 1984. TDS ranged from 330 to 1,900 mg/L, with a mean value of 988 mg/L. In general, dominant cations were calcium and

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magnesium and dominant anions were bicarbonate and sulfate; however, there were seasonal variations that related directly to TDS, which was related to streamflow and mine discharges (Price and Plantz, 1987). In 12 samples analyzed for lead, maximum concentration was 55 $\mu\text{g/L}$, which is above the Utah Division of Water Quality (UDWQ, 1994) criteria of 50 $\mu\text{g/L}$ for aquatic wildlife and domestic water sources. Eight samples were analyzed for mercury, with mercury concentrations ranging from below the detection limit of 0.1 $\mu\text{g/L}$ up to 1.4 $\mu\text{g/L}$, which all fall below the UDWQ criteria of 2 $\mu\text{g/L}$ for Class 1C and 2.4 $\mu\text{g/L}$ for Classes 3A-3D waters; however, some exceeded the criteria for the protection of human health of 0.144 $\mu\text{g/L}$.

Phenols come from natural organic sources but can also be indicators of polluting effluents from industrial processes, including coal mining. The limit for Class 1C waters for the protection of human health is 300 $\mu\text{g/L}$, but for aquatic wildlife (Classes 3A-3D) the limit is only 10 $\mu\text{g/L}$ (UDWQ, 1994). For many species of fish 5 $\mu\text{g/L}$ has been reported to be harmful (Waddell and others, 1981). The detection limit for the twenty phenol analyses reported was 40 $\mu\text{g/L}$ (Price and Plantz, 1987), so phenol levels may have exceeded water quality standards for aquatic wildlife without being detected.

Suspended sediments in 25 samples ranged from 4 to 1,640 mg/L. The largest calculated instantaneous sediment load was 518 tons/day. The sampled sediments were about 17 % coal, with water discharged from the mines being the probable source (Price and Plantz, 1987).

Price and Plantz (1987) reported good benthic-invertebrate diversity. In the five phytoplankton samples collected in 1981, green algae had a uniform distribution but blue-green algae had relatively larger numbers in three.

Monitoring of Grassy Trail Creek by Sunnyside Mines showed that from 1989 through 1992, when sampling ceased, TDS consistently exceeded 1,200 mg/L at GT-4, located between the Sunnyside Mine and the town of Sunnyside (Plate 1). During this same period TDS concentrations also increased at GT-2 and GT-3, monitoring sites upstream of the main mine area (Figure 6). This does not appear to have been solely due to road salting because concentrations of all ions increased more-or-less uniformly. Elevated TDS has not been measured in the few samples that have been collected from the ephemeral streams on the west side of West Ridge.

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SUMMARY OF SELECT WATER QUALITY DATA FROM USGS STATIONS PRICE RIVER AT WOODSIDE AND GREEN RIVER AT GREEN RIVER UTAH

STATION NUMBER	STATION NAME	WATER YEAR	SPECIFIC CONDUCTANCE (micro-mhos)	pH (units)	TEMPERATURE (deg. C)	DIS-SOLVED SOLIDS RESIDUE at 180 deg. C	CALCIUM Ca	MAGNESIUM Mg	SODIUM Na	POTASSIUM K	CHLORIDE Cl	SULFATE SO ₄	BI-CARBONATE HCO ₃	IRON		MANGANESE		SUSPENDED SEDIMENT
														TOTAL Fe	DISSOLVED Fe	TOTAL Mn	DISSOLVED Mn	
09314500	Price River at Woodside	1975-76	Min. 2,200 Max. 4,950	8.2 8.0	0 26.5	1,070 4,830	170 310	85 250	230 730	7.0 12.0	31 78	1,000 2,000	260 330	-	-	-	-	-
		1976-77	Min. 1,370 Max. 6,950	7.4 8.7	0 29.0	1,150 6,770	220 400	16 350	77 1,100	7.0 15.0	15 130	600 4,300	170 570	440 510,000	10 70	16,000	8 110	17 69,400
		1977-78	Min. 1,140 Max. 6,090	7.6 8.7	0 26.0	1,290 4,990	110 330	79 290	190 760	4.0 13.0	22 100	640 3,100	40 450	10 18,000	10 20	90 860	10 60	27 4,420
		1978-79	Min. 1,110 Max. 6,540	8.0 8.4	- 21.5	822 6,240	83 250	51 320	110 990	3.4 17.0	17 110	390 3,700	240 500	280 46,000	-	10 1,300	- 20	16 5,560
		1979-80	Min. 1,090 Max. 5,510	8.0 8.7	0 23.0	761 5,660	-	-	-	-	-	-	270 520	-	0	2,600	-	93 12,200
		1980-81	Min. 2,720 Max. 4,480	8.0 8.3	0 24.0	2,070 3,860	130 250	130 230	300 640	7.2 12.0	52 96	1,300 2,500	160 330	-	-	180	-	0 5,200
		1981-82	Min. 1,170 Max. 4,080	8.0 8.3	0 23.5	830 2,880	82 240	53 210	97 530	2.9 8.9	16 90	360 2,100	194 350	9,600 24,000	-	240 820	-	150 23,000
		1982-83	Min. 830 Max. 3,920	8.2 8.4	0 20.0	830 3,500	82 260	53 220	97 520	2.3 8.9	17 79	210 2,200	210 340	-	-	960	-	110 12,000
09315000	Green River at Green River	1975-76	Min. 450 Max. 1,030	8.1 8.7	0 26.0	276 704	41 82	19 35	30 110	1.0 3.3	7.7 35	110 300	150 270	570 32,000	0 60	30 1,000	0 20	32 3,403
		1976-77	Min. 530 Max. 1,520	7.7 8.7	0 29.0	335 1,210	49 190	15 43	44 110	2.1 7.0	15 33	150 670	160 300	1,300 330,000	0 190	30 7,600	0 20	- 18,300
		1977-78	Min. 300 Max. 1,070	7.9 8.5	0 28.5	212 756	33 81	13 39	33 120	1.0 3.5	7.1 38	69 350	190 270	1,700 21,000	10 40	50 630	0 10	95 13,400
		1978-79	Min. 300 Max. 1,240	8.0 8.5	0 28.0	273 852	35 87	15 42	29 110	- 9.5	8 41	86 390	-	830 19,000	0 120	40 500	0 8	49 47,500
		1979-80	Min. 320 Max. 1,310	7.6 8.5	0 27.0	214 798	29 85	12 37	21 110	1.5 5.0	7.4 38	70 410	130 260	2,000 39,000	<10 40	50 1,100	1 10	60 11,600
		1980-81	Min. 320 Max. 1,200	7.8 8.3	0 26.0	273 852	47 82	19 41	50 110	1.8 3.7	14 40	160 350	110 190	1,200 27,000	<10 30	40 880	1 10	19 5,760
		1981-82	Min. 290 Max. 1,060	8.0 8.4	0 27.5	196 749	29 82	10 40	19 100	0.6 3.3	6 37	60 320	90 180	10,000 31,000	5 20	210 840	<1 6	134 16,700
		1982-83	Min. 400 Max. 960	8.0 8.4	0 25.0	494 584	30 69	15 32	29 76	-	9.3 25	98 270	111 104	-	6 31	-	3 130	64 5,650

Notes: Station locations: See Figure 4 (Price River Drainage Basin). Constituents : in mg/L, except manganese and iron, which are in micrograms/L. Specific Conductance: field determinations. pH: field determinations.

Table 1

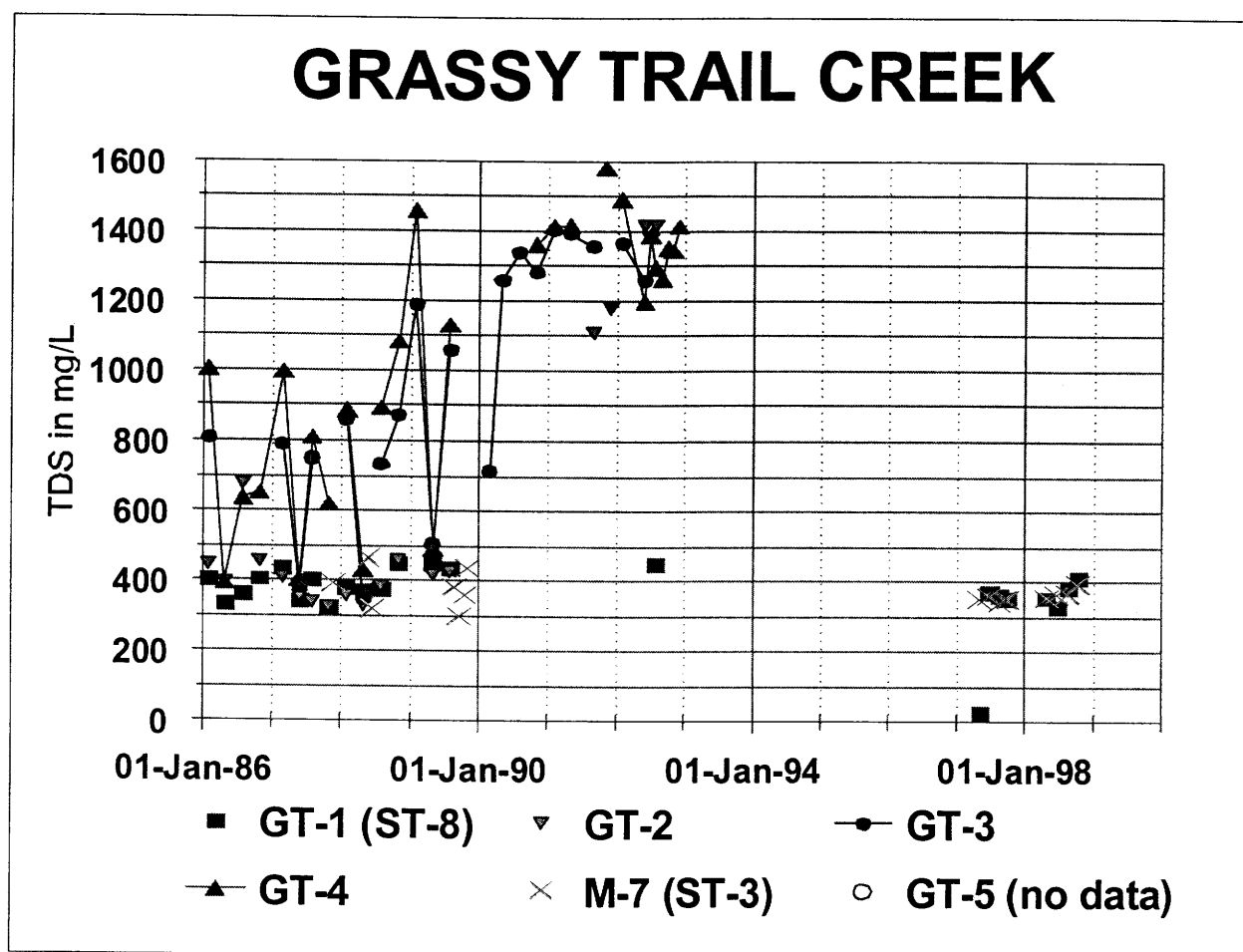


Figure 6- TDS in Grassy Trail Creek

Climatological Information

The permit area is located in the northwestern portion of the Price River basin in eastern Utah. The basin is surrounded almost completely by mountains, with elevations of over 9,000 ft. in the CIA. The mountains greatly influence local weather, inhibiting cold arctic air masses from penetrating into the region and acting as a barrier to storms approaching from every direction except south. Clear days predominate.

Daily climatic information is collected at a National Weather Service station in Sunnyside, Utah. Mean monthly precipitation at Sunnyside is shown in Figure 7. Average annual precipitation is 13.56 inches. The area typically receives the greatest quantity of moisture from thundershowers in the late summer and early fall (August-October). The driest months at Sunnyside are November to February. Average annual precipitation in the area around the West Ridge Mine ranges from approximately 8 inches along lower Grassy Trail Creek to 16 inches on West Ridge and in upper Whitmore Canyon (Mundorff, 1972, Plate 2). In the Price River basin as a whole, approximately 65% of total precipitation at elevations above 6,000 feet falls as snow during the period from October to April (Mundorff, 1972). At the West Ridge site average annual snow accumulation is about 1 foot, but varies with elevation, topography, and aspect. At

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the mouth of Whitmore Canyon (elevation 6,750 feet) snow accumulations range from 0 to 21 inches during October through March, but at 7,280 feet snow accumulations ranged from 0 to 50 inches. Monthly maximum, mean maximum, and mean daily snow accumulations for the years 1973 through 1983 are in Table 2. Ground accumulations of snow are characteristically of short duration due to melting and sublimation (Chapter 4 of the West Ridge PAP). Average annual snowfall from 1958 to 1988 at the Sunnyside Mine, approximately elevation 6,800 feet, was 38 inches (Ashcroft and others, 1992).

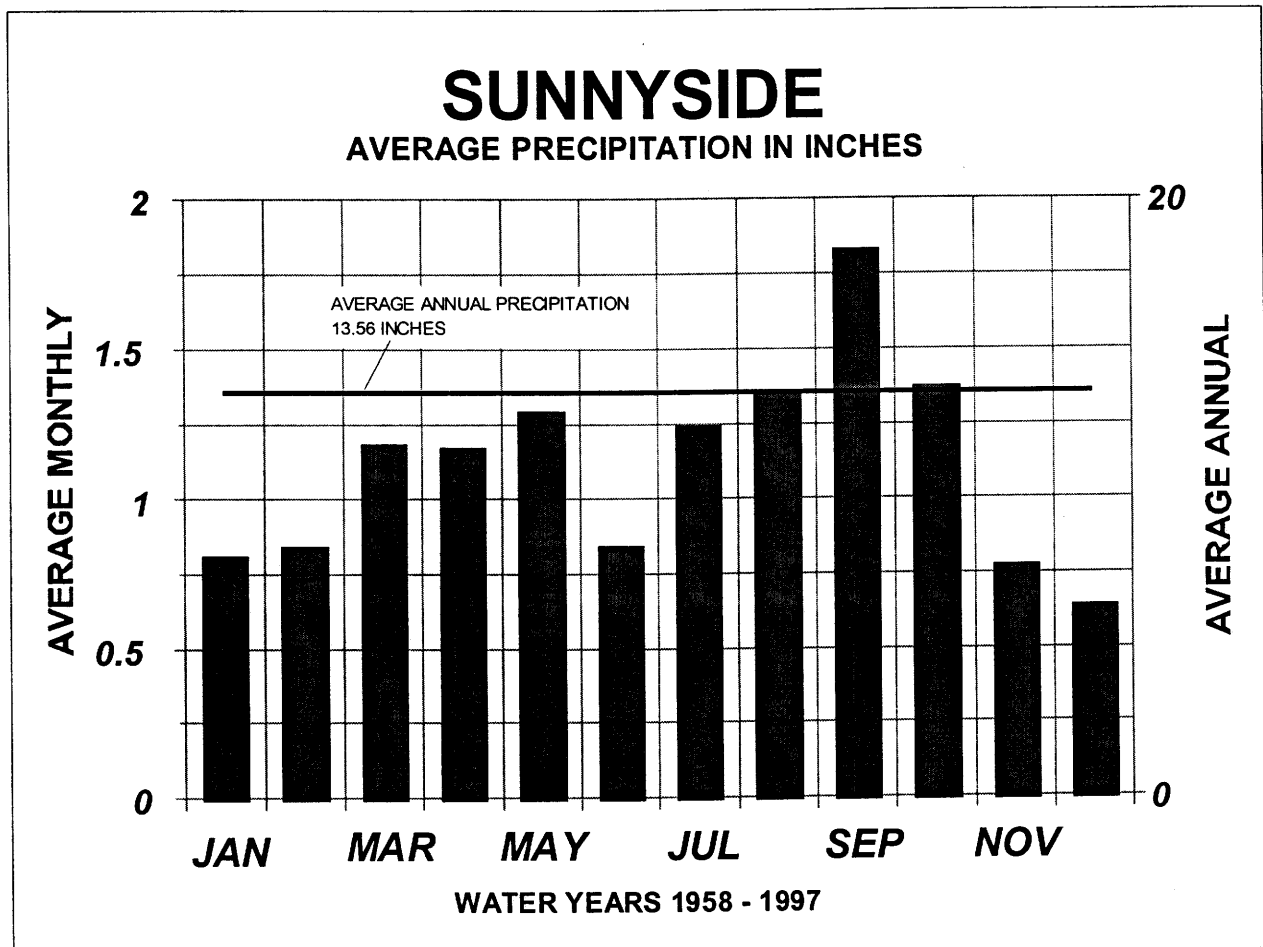


Figure 7- Precipitation at Sunnyside, Utah

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SNOW ACCUMULATION IN INCHES, 1973-1983 SUNNYSIDE MINE (approximately 6,800 feet elevation)

	<u>Maximum</u>	<u>Mean</u> <u>Maximum</u>	<u>Mean</u> <u>Daily</u>
October	6.5	1.35	0.73
November	6.0	1.69	0.28
December	14.00	4.42	1.73
January	21.00	9.86	4.01
February	21.00	6.44	2.84
March	15.00	5.30	0.60

Table 2

Measured evapotranspiration in the Sunnyside area is 41 to 43 inches (Ashcroft and others, 1992). In Chapter 4 of the West Ridge PAP it is reported that Sunnyside Coal Company estimated potential evaporation to be over 60 inches.

Temperature ranges of the permit area are typical for a semi-arid region, with colder temperatures at higher elevations. At the Sunnyside Mine (1958 to 1988) average maximum temperature was 58 degrees, average mean was 46, and the average minimum was 33 degrees. Average monthly temperatures ranged from about 14° F in January to about 85° F in July. Last freeze is typically in late May and first freeze in late September to early October (Ashcroft and others, 1992).

The Palmer Hydrologic Drought Index (PHDI) indicates long-term climatic trends for the region. The PHDI is a monthly value generated by the National Climatic Data Center (NCDC) that indicates the severity of a wet or dry spell. The PHDI is computed from climatic and hydrologic parameters such as temperature, precipitation, evapotranspiration, soil water recharge, soil water loss, and runoff. Because the PHDI takes into account parameters that affect the balance between moisture supply and moisture demand, it is a useful for evaluating the long-term relationship between climate and groundwater recharge and discharge. Figure 8 shows the Palmer Hydrologic Drought Index for Utah Divisions 6 and 7; the permit area lies at the boundary of these two regions. These graphs indicate extremely wet years between the late 1970's and late 1980's, followed by several years of drought in the late 1980's and early 1990's. Since about 1993, wet and dry cycles have been shorter.

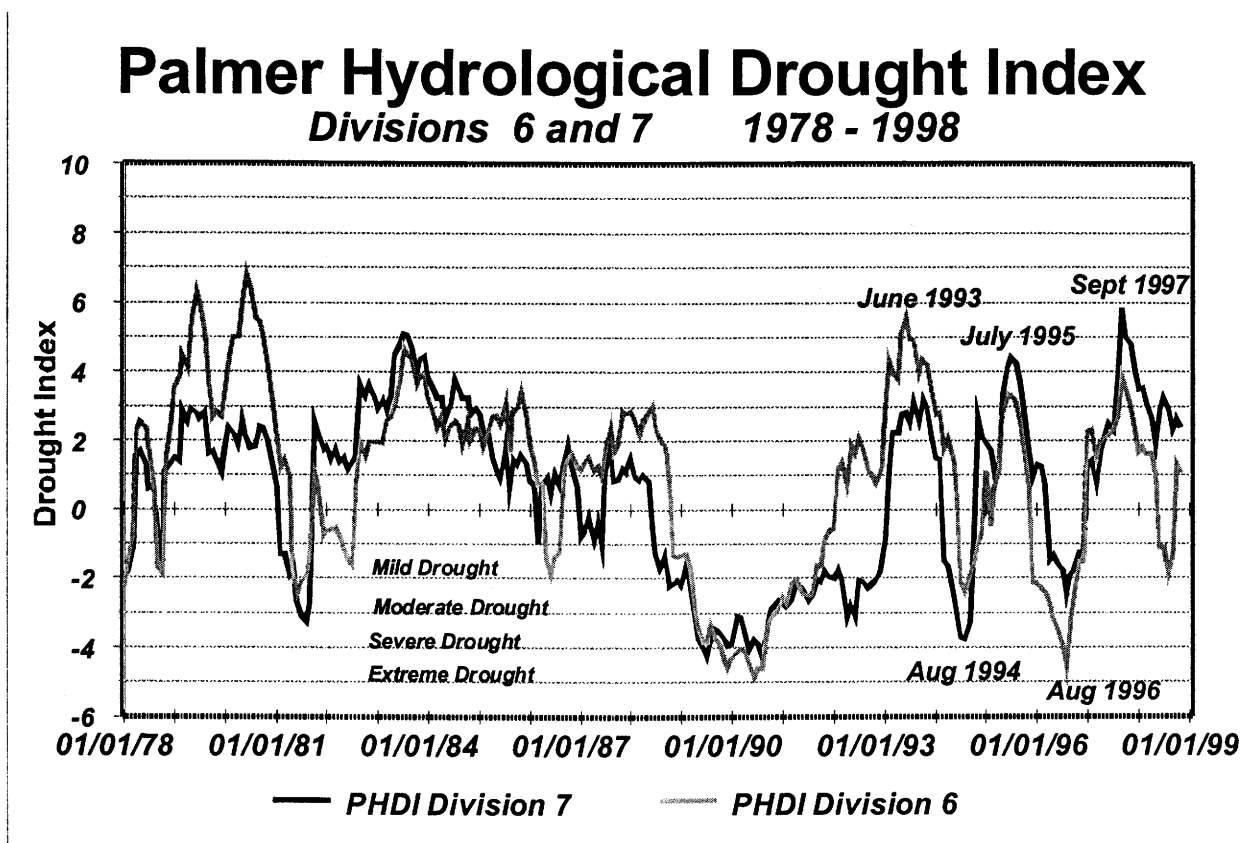


Figure 8- Palmer Hydrologic Drought index, Divisions 6 and 7

Wind

Wind data were collected by Sunnyside Cogeneration Associates (SCA) during 1982 and 1983 for permitting of the SCA power plant (the applicant for the West Ridge Mine permit obtained these data from the 1993 Sunnyside Coal Company MRP). The SCA data, collected near East Carbon from atop a 45-meter tower, show that the majority of the winds are from the north-northeast through the south-southwest (clockwise) with an average annual speed of 6.2 mph.

Upper level winds, over 1,600 feet above the ground level, are generally from the southwest during most of the year. The wind high in the atmosphere tend to be strong but decrease toward the surface where obstructions and surface friction come into play. During the winter, air flow from the northeast is common. Local night airflow patterns are primarily follow canyon bottoms from the mountains down to the valleys, and wind speed is induced by descent of colder air and is generally light. Daytime flow is strongly influenced by surface heating effects that result in mixing between the surface and upper flows. There is a general air flow toward the north and northeast (to higher elevations) during the day, and toward the southwest (toward lower elevations) during the night. Winds are usually light to moderate (below 20 mph) unless influenced by localized thunderstorms or moving frontal systems. Higher wind speeds are generally associated with storm systems and higher elevations such as ridge tops and plateaus

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(Chapters 4 and 7 of the West Ridge MRP).

IV. IDENTIFY HYDROLOGIC CONCERNS

The CHIA is based on the best currently available data and is a prediction of mining related impacts to the hydrologic balance outside of the specific permitted coal mine areas. To verify that conditions remain within acceptable limits the mine operator is required to monitor water quality and quantity as part of the permit requirements. The plans for monitoring are set forth in the Mining and Reclamation Plans (MRP) for the West Ridge Mine and have been determined adequate by UDOGM to meet regulatory requirements. If monitoring results show significant departures from the values established in the MRP's and in this CHIA or exceed UPDES discharge requirements, immediate remedial actions are provided for by SMCRA.

Water quality standards for surface waters in the State of Utah are found in R317-2, Utah Administrative Code (UAC). The standards are intended to protect the waters against controllable pollution. Waters, and the applicable standards, are grouped into classes based on beneficial use designations. The Utah Division of Water Quality of the Department of Environmental Quality has classified surface waters in the West Ridge CIA as:

- 2B - protected for recreational uses except swimming,
- 3C - protected for nongame fish and aquatic life, and
- 4 - protected for agricultural uses.

General hydrologic concerns include changes of flow rates and chemical composition that could physically affect the off-permit hydrologic balance. Changes to the existing hydrologic regime or balance need to be limited in order to prevent economic loss to existing agricultural and livestock enterprises, prevent significant alteration to the channel size or gradient, and maintain adequate capacity for existing fish and wildlife communities. The basis for the limiting value of a parameter may differ according to specific site conditions.

Sediment is a common constituent of ephemeral stream flow in the western United States. The quantity of sediment in the flows affects stream-channel stability and most uses of the water. Excessive sediment deposition is detrimental to existing aquatic and wildlife communities. Large concentrations of sediment in streamflow may preclude use of the water for irrigating crops because fine sediment tends to reduce infiltration rates in the irrigated fields, and the sediment reduces capacities of storage facilities and damages pumping equipment. Mean sediment load is the indicator parameter for evaluating the sediment hazard to stream-channel stability and irrigation.

The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. The quality of water from underground sources reflects the chemical composition of the rocks it passes through. That quality may be degraded by intrusion of poorer quality water from wells or mines, by leakage from adjoining formations, or by recharge through disturbed materials. Ground water discharging from seeps and springs is

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used by wildlife and livestock. The state standard for TDS for irrigation of crops and stockwatering (Class 4) is 1,200 mg/L.

Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support fish and other aquatic life. Baseline studies of invertebrates (Lines and Plantz, 1981; and USGS, 1980, 1981, 1982 and 1983) provide standards against which actual conditions in Grassy Trail Creek can be evaluated if desired. Price and Plantz (1987) summarized invertebrate data for Grassy Trail Creek, and Waddell and others (1982) include invertebrate data for nearby Soldier and Pine Creeks.

The Utah Department of Environmental Quality, Division of Water Quality can authorize a coal mine to discharge into surface waters under the Utah Pollutant Discharge Elimination System (UPDES). The West Ridge Mine has a UPDES permit to discharge to Grassy Trail Creek from two points: UPDES point # 1 is located at the principal spillway of the sediment pond, and UPDES point #2 is located near the mine portals at a culvert riser that leads directly into the main bypass culvert. UPDES sample point #2 is to sample water that may be discharged directly from the mine.

The West Ridge Mine UPDES permit contains limitations on TDS (one-ton/day), total suspended solids (30-day average, 25 mg/L; 7-day average, 35 mg/L; daily maximum, 70 mg/L), total settleable solids (0.5 ml/L for storm-water discharges), total iron (1.0 mg/L), oil and grease (10 mg/L), and pH (between 6.5 and 9.0). There is no limit on flow but it is to be measured monthly, and the duration of intermittent discharge is to be reported along with flow. Additionally, there can be no more than a trace amount of visible sheen, floating solids, or foam and no discharge of sanitary waste or coal process water. Monitoring is by monthly grab samples. (Sunnyside Coal Company had an approved UPDES permit with a TDS concentration limit of 1,650 mg/l for the mine water discharge)

Utah water quality standards exist for numerous parameters other than those already mentioned above, but at this time there is no evidence or reason indicating they are of concern or have a reasonable potential to affect the hydrologic balance of the CIA. However, those parameters that may have a reasonable possibility of affecting the hydrologic systems are included in routine water quality monitoring of the mine operations. Review of monitoring results by the mine operators and UDOGM will identify concerns or problems and generate revisions of the mine operations to mitigate those problems.

V. IDENTIFY RELEVANT STANDARDS

RELEVANT STANDARDS

Flow: There is no standard for flow in the Utah water quality standards. The West Ridge Mine UPDES permit contains no limit on flow. Discharge is to be measured monthly, and the duration of intermittent discharge is to be reported along with

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flow. Characteristics such as stream morphology, vertebrate and invertebrate populations, and water chemistry can be affected by changes in flow and therefore can provide an indirect standard for flow.

Oil and Grease: There is no State water quality standard for oil and grease, but the West Ridge Mine UPDES permit limit is a daily maximum of 10 mg/L, which is typical of UPDES permits for coal mines in the Wasatch Plateau and Book Cliffs. Only one grab-sample a month is required to measure oil and grease, but any observation of visual sheen requires a sample be taken immediately. A 10 mg/L oil and grease limit does not protect fish and benthic organisms from soluble oils such as those used in longwall hydraulic systems, and UDWR has recommended soluble oils be limited to 1 mg/L (Darrell H. Nish, Acting Director UDWR, letter dated April 17, 1989 to Dianne R. Nielsen, Director UDOGM).

Total Dissolved Solids (TDS) concentrations: The West Ridge Mine UPDES permit allows up to one-ton per day, to be determined by one grab sample per month. TDS is commonly used to indicate general water quality with respect to inorganic constituents. There is no state water quality standard for TDS for Classes 1, 2, and 3, but 1,200 mg/l is the limit for agricultural use (Class 4). The Soldier Canyon Mine UPDES permit limits instantaneous TDS concentration to 1,200 mg/L, determined by 2 grab samples a month, and the total amount of dissolved solids discharged from all Soldier Canyon Mine operations is limited to 5 tons/day, determined by the twice monthly measurements of flow and TDS. Sunnyside Coal Company had an approved UPDES permit with a TDS concentration limit of 1,650 mg/l for the mine water discharge.

pH: Allowable pH ranges are 6.5 to 9.0 under State water quality standards for all Classes, and also under the West Ridge UPDES permit.

Total Suspended Solids (TSS) and Settleable Solids: the West Ridge UPDES permit has the following allowable limits on TSS: 30-day average, 25 mg/L; 7-day average, 35 mg/L; daily maximum, 70 mg/L. TSS is to be determined by a monthly grab sample. These limits are similar to those at the Soldier Canyon Mine.

There is no State water quality standard for solids in the water, but an increase in turbidity is limited to 10 NTU for Class 2A, 2B, 3A, and 3B waters and to 15 NTU for Class 3C and 3D waters.

Under the West Ridge Mine UPDES permit, all samples collected during storm water discharge events are to be analyzed for settleable solids. Samples collected from increased discharge, overflow, or bypass that is the result of precipitation that does not exceed the 10-year, 24-hour precipitation event may comply with a settleable solids standard of 0.5 ml/L daily maximum rather than the TSS standard, although TSS is still to be determined (and the other UPDES parameters). If the increased discharge, overflow, or bypass is the result of precipitation that exceeds the 10-year, 24-hour precipitation event, then neither

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the TSS nor settleable solids standard applies.

Iron and Manganese: The West Ridge UPDES permit allows a daily maximum of 1.0 mg/L total iron, determined by a monthly grab sample. The UPDES permit at the Soldier Canyon Mine allows the same daily maximum, but with approval from the Division of Water Quality up to 2 mg/L total iron can be discharged under certain circumstances, which include maintaining dissolved iron at or below 1 mg/L. State water quality standards allow a maximum of 1,000 µg/L dissolved iron in Class 3A, 3B, 3C, and 3D waters, with no standard for Class 1, 2, and 4 waters.

Monitoring of total manganese is required by SMCRA and the Utah Coal Mining rules, but there is no UPDES or Utah water quality standard for either total or dissolved manganese.

Macroinvertebrates: Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support fish and other aquatic life. Baseline studies of invertebrates (Lines and Plantz, 1981; USGS, 1980, 1981, 1982 and 1983; Waddell and others, 1982; and Price and Plantz, 1987) provide standards against which actual conditions in Grassy Trail Creek and several nearby creeks can be evaluated if desired.

Utah water quality standards exist for numerous parameters other than those mentioned above, but at this time there is no evidence to indicate nor reason to believe that those parameters are of concern in the West Ridge CIA. However, additional parameters recommended for routine monitoring in UDOGM directive Tech-004 are included in the water-monitoring plan of the West Ridge Mine operations.

MATERIAL DAMAGE

Material damage to the hydrologic balance would possibly manifest itself as an economic loss to the current and potential water users, would result in quantifiable reduction of the capability of an area to support fish and wildlife communities, or would cause other quantifiable adverse change to the hydrologic balance outside the permit area. The basis for determining material damage may be found to differ from site-to-site within the CIA according to specific site conditions. Surface-water and ground-water concerns have been identified for CHIA evaluation.

Parameters for surface-water quantity and quality

The potential material-damage concerns this CHIA focuses on are changes of surface flow rates and chemical composition that would physically affect the off-permit stream channel systems as they presently function and affect aquatic and wildlife communities and agricultural and livestock production. Therefore, criteria are intended to identify changes in the present discharge regime that might be indicators of economic loss to existing agricultural and livestock enterprises; of significant alteration to the channel size or gradient; or of a loss of capacity to

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support existing fish and wildlife communities. In order to assess the potential for material-damage to these elements of the hydrologic system, the following indicator parameters were selected for evaluation at each evaluation site: low-flow discharge rate, TDS, and sediment load.

The surface-water concerns will be evaluated at ST-3, ST-8, ST-9, and ST-10 in the Grassy Trail Creek drainage, S-80 in Hanging Rock Canyon, and at ST-5, ST-6, and ST-6A in C Canyon. There will also be monitoring stations in the ephemeral Bear Creek and A Canyon drainages. Locations are identified on Plate 1.

Low-Flow Discharge Rate

Measurements provided by mine operators are generally of instantaneous flow and provide some indication of long-term trends, but are probably no more accurate either individually or as a whole than the "poor" USGS measurements. In the Wasatch Plateau, Waddell and others (1981) found that correlating three years of low-flow records (September) at stream sites against corresponding records from long-term monitoring sites would allow the development of a relationship that could be used to estimate future low-flow volumes at the stream sites within a standard deviation of approximately 20 %. Ten years of measurements reduced the standard deviation to 16 - 17 % and 15 years of data reduced it to about 15 %. This relationship has not been demonstrated for streams in the Book Cliffs; however, it indicates that a change in low-flow rates of less than 15 to 20 % probably would not be detectable. A 20 % decrease in the low-flow rate will provide a threshold indicator that decreased flows are persisting and that an evaluation for material damage is needed.

Monitoring of mine-discharge rates during low-flow periods will also provide a means to evaluate effects of the mine discharge on the receiving streams. The potential for material damage by mine discharge water is tied to the effect of that discharge on the flow in the receiving streams, and that effect will be most pronounced during low-flow. Water from the West Ridge Mine disturbed area will be monitored at the UPDES discharge point at the sediment pond. Direct discharge from the mine will be monitored at the UPDES point located near the mine portals, a culvert riser that leads directly into the main bypass culvert.

Total Dissolved Solids (TDS)

The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. Wildlife and livestock use is the designated postmining land use, so established dissolved solids tolerance levels for wildlife and livestock have been adopted as the thresholds beyond which material damage may occur. The state standard for TDS for irrigation of crops and stockwatering (Class 4) is 1,200 mg/L. If TDS concentrations persistently exceed 1,200 mg/L it will be an indication that evaluation for material damage might be needed. On Soldier Creek there have been single samples from both UPDES and stream monitoring in which TDS has exceeded this 1,200 mg/L threshold.

Monitoring of Grassy Trail Creek by Sunnyside Mines (Figure 6) showed that from 1989 through 1992, when sampling ceased, TDS consistently exceeded 1,200 mg/L at GT-4, located between the Sunnyside Mine and the town of Sunnyside (Plate 1). During this same period TDS

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concentrations also increased at GT-2 and GT-3, monitoring sites upstream of the main mine area. Monitoring of ST-9, ST-10 and S-80 began in 2002 and will monitor undisturbed flow up-gradient of the permit area.

Sediment Load

Sediment is a common constituent of ephemeral stream flow in the western United States. The quantity of sediment in the flows affects stream-channel stability and most uses of the water. Excessive sediment deposition is detrimental to existing aquatic and wildlife communities. Large concentrations of sediment in streamflow may preclude use of the water for irrigating crops because fine sediment tends to reduce infiltration rates in the irrigated fields, and the sediment reduces capacities of storage facilities and damages pumping equipment. Sediment load measurement error is, at a minimum, the same as the flow measurement error because sediment load is directly dependent on flow and in practice cannot be measured more accurately than the flow.

TSS is the indicator parameter initially chosen for evaluating the sediment hazard to stream-channel stability and irrigation. Threshold values have initially been set as the greater of 1 standard error above the baseline mean TSS value or 120 % of the baseline mean TSS value (by analogy with the low-flow discharge rate measurement accuracy and assuming that the error in TSS will contribute equally to the error in flow when determining mean sediment load). If TSS concentrations persistently exceed these threshold values it will be an indication that evaluation for material damage from sediment load in the streams might be needed.

Parameters for ground-water quantity and quality

The potential material-damage concerns this of CHIA are intended to limit changes in the quantity and chemical composition of water from ground-water sources to magnitudes that: will not cause economic loss to existing or potential agricultural and livestock enterprises; will not degrade domestic supplies, would not cause structural damage to the aquifers; and will maintain adequate capacity for existing fish and wildlife communities.

To assess the potential for material damage to these elements of the ground-water hydrologic system, the following indicator parameters were selected for evaluation: seasonal flow from springs and TDS concentration in spring and mine-discharge water.

Ground-water concerns will be monitored at six springs in the Whitmore Canyon drainage and one in C Canyon. Drill hole DH-86-2 will also monitor ground water in C Canyon, within the West Ridge Mine permit area. Locations are identified on Plate 1.

Seasonal flow from springs

Maintain potentiometric heads that sustain average spring discharge rates, on a seasonal basis, equal or greater than 80 % of the mean seasonal baseline discharge, or in other words baseline minus 20 % probable measurement error. The 20 % measurement error is based on

analogy with the accuracy of measuring low-flow surface discharge rates. A 20 % decrease in flows, determined on a seasonal basis, will indicate that decreased flows are probably persisting and that an evaluation for material damage is needed.

TDS concentration

The concentration of total dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. The quality of water from underground sources reflects the chemical composition of the rocks it passes through. Ground-water quality may be degraded by intrusion of poorer quality water from wells or mines, by leakage from adjoining formations, or by recharge through disturbed materials. Ground water discharging from seeps and springs is used by wildlife and livestock, and those are the designated postmining land uses. There is no water quality standard for TDS for aquatic wildlife. The state standard for TDS for irrigation of crops and stockwatering (Class 4) is 1,200 mg/L. If TDS concentrations persistently exceed 1,200 mg/L it will be an indication that evaluation for material damage might be needed.

Water samples collected from several locations inside the Sunnyside Mine, in particular sumps, consistently had TDS levels in excess of 1,200 mg/L; many of the samples from areas other than sumps had better quality water with TDS levels between 400 to 800 mg/L, which is probably more representative of the ground water that was flowing into the mines. TDS levels in drill hole DH-86-1 were also in the 400 to 800 mg/L range, but 15 of 17 samples from DH-86-1 had TDS above 1,200 mg/L. Waters from springs SP-6, SP-8, and PC-1 also are high in TDS.

VI. ESTIMATE PROBABLE FUTURE IMPACTS OF MINING ACTIVITY

GROUND WATER

Dewatering and subsidence related to mining have the greatest potential for impacting ground-water resources in the CIA.

Dewatering

Underground mining removes the support to overlying rock causing caving and fracturing of the overburden. In most mining areas it is unlikely that fractures will reach shallower perched aquifers because of the thickness of the overburden, but in areas where fracturing is extensive, subsidence induced caving and fracturing can create conduits that allow ground water to flow into the mine. Dewatering caused by fracturing may decrease aquifer storage and ground-water flow to streams and springs (Figure 9). Water quality downstream from the mines could improve because water being discharged from coal mines in the Book Cliffs and Wasatch Plateau is often of better quality than natural spring flow or base flow.

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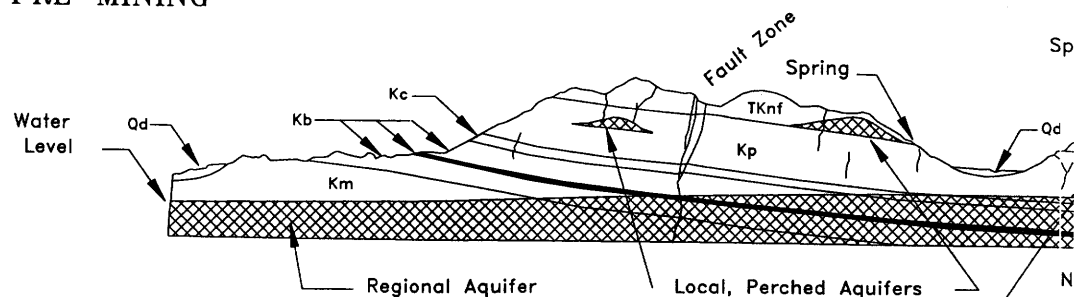
Total ground-water storage above the Gilson seam at the Soldier Canyon Mine has been estimated to be 490,000 ac-ft, assuming an average saturated thickness of 1,000 feet, an area of 4,900 acres, and a storage coefficient of 0.10 (Soldier Canyon Mine MRP p. 7-28). At the West Ridge Mine, the maximum cover exceeds 2,500 feet and the average overburden is approximately 1,500 feet, so 1,000 feet may be a reasonable estimate of saturated thickness for West Ridge. Federal coal lease SL-068754 is 2,570.67 acres, the extension to SL-068754 is 80 acres, and Federal Lease UTU- 78562 is approximately 1646 acres for a total of approximately 4297 acres. Therefore an estimate of total ground-water storage above possible West Ridge mine workings is 430,000 ac-ft.

Annual average ground-water recharge for the 10.4 mile² of the Soldier Canyon Mine permit area has been estimated to be 740 ac-ft using 9 % as the average infiltration factor. Recharge and discharge relations for the Dugout Canyon area are discussed on pages 7-30 and 7-31 of the Dugout Canyon Mine MRP, but no estimate of recharge volume is made. Because of hydrologic isolation between the Blackhawk Formation and the surface, West Ridge Resources, Inc. does not foresee an increase in recharge rates or a decrease in discharge rates at the surface because of dewatering of deeper strata. Another reason that a notable or measurable increase in recharge is also unlikely is because recharge is generally available only for a few months during spring snowmelt and for very brief periods during summer thundershowers. During these seasonal, relatively short events the soils reach saturation quickly and reject most available water.

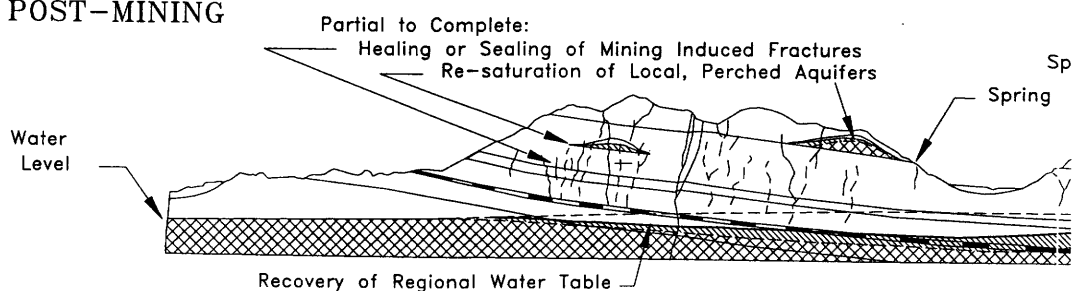
The Blackhawk Formation is probably saturated in most areas (Waddell and others, 1986, p. 41) and the West Ridge Mine might be expected to produce water at rates similar to those observed in the Soldier Canyon Mine. Most water entering the Soldier Canyon Mine comes through leaks in the mine roof, and Mayo and Associates (Soldier Canyon Mine MRP, Appendix 7-3, p. 17) calculated that the average annual flow into the mine between 1988 and 1994 was approximately 680 ac-ft/yr. The average annual flow into the Soldier Canyon Mine between 1985 and 1991 increased from about 160 to approximately 1,000 ac-ft/yr, and the estimate of average ground-water interception due to continued mining activities at the Soldier Canyon Mine is 460 ac-ft/yr (Soldier Canyon Mine MRP, p. 7-28).

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PRE-MINING



POST-MINING



Subsidence

Subsidence impacts are largely related to extension and expansion of existing fracture systems and upward propagation of new fractures (Figure 9). Inasmuch as vertical and lateral migration of water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably produce changes in the configuration of ground-water flow. Potential changes include decreased flow through existing fractures that close, increased flow rates along existing fractures that open further, and the diverting of ground-water flow along new fractures or within newly accessible permeable lithologies. Subsurface flow diversion may cause the depletion of water in local aquifers and loss of flow to springs that are undermined. Increased flow rates along fractures could potentially improve water quality by reducing ground-water residence time.

Annual reports for 1988, 1989, 1992, 1993, 1994, 1995, and 1996 for the Soldier Canyon Mine indicate no subsidence over the current permit area (indicated elevation changes are within the limit of accuracy of the survey method). Mining has occurred beneath 500 to 2,000 feet of overburden and mining is projected to be done beneath up to 2,250 feet of cover. The Castlegate Sandstone and thick overburden are responsible for reduced surface subsidence at Soldier Canyon.

Mining at West Ridge is currently planned for the Rock Canyon seam only. Overburden thickness will generally be less than 1,600 feet and range from 500 feet to 2,500 feet. The Castlegate Sandstone is present at West Ridge and will help limit effects of subsidence at the

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surface. The potential for subsidence related surface impacts (e.g., ponding) to the subsurface and surface hydrologic regimes is not considered significant by West Ridge Resources, Inc.

SURFACE WATER

Changes in flow volume and in water quality have the greatest potential for impacting surface-water resources in the CIA. Sites that have been or are being used to monitor surface water are shown on Plate 1.

Water Quality

The quality of the local surface waters can be affected by two basic processes. First, the runoff from the operator's disturbed lands and waste piles could increase sediment concentrations and alter the distribution and concentration of dissolved solids in the receiving streams. This potential for inducing water quality changes in Grassy Trail and other streams has been fully recognized, and the runoff control plan established for the West Ridge Mine is adequate in anticipating, mitigating and monitoring the potential impacts.

The second potential cause of surface water quality changes is related to the location and chemistry of ground-water discharges, both from the mines and from springs and baseflow. The Flagstaff Limestone reservoir has high hydraulic diffusivity. Perennial flow of Soldier Creek is sustained by spring and seep discharge and baseflow from the Flagstaff Limestone during spring and early summer snowmelt; however, discharge during the fall and winter is greatly reduced and discharge from underlying formations, mainly the Blackhawk, sustains the stream flow (Waddell and others, 1986, p. 28). In Whitmore Canyon and the West Ridge area the Flagstaff Limestone is thin and poorly exposed, so it does not contribute significantly to sustaining stream flow at any time of year.

TDS concentration in ground water from the Flagstaff Limestone is generally lower than that in ground water from underlying formations. In upper Pine Creek TDS was 200 to 300 mg/L in water-years 1979 and 1980, with magnesium, calcium and bicarbonate ions dominant; however, in lower Soldier Canyon where baseflow is from the North Horn and Blackhawk Formations, TDS ranged from about 300 to 700 mg/L. At low flow the dominant ions were sodium, magnesium, sulfate, and carbonate, but at high flow calcium and bicarbonate dominated (Waddell and others, 1982; 1986) because ground water from the Blackhawk was contributing a smaller portion of total flow and therefore had a smaller effect on the quality of the stream water. Based on data from water-year 1979 at station 09314340 on Grassy Creek the dominant ions at low flow were calcium and sulfate and at high flow were magnesium and bicarbonate (Figure 17 in Lines and Plantz, 1981).

Discharge water from the Sunnyside Mines, located southeast of West Ridge, had TDS concentrations of about 1,600 mg/l, with the dominant ions being sodium, sulfate, and bicarbonate (Sunnyside Coal Company, 1993). The chemical composition was similar to that of water in contact with the Mancos Shale. The TDS concentration of discharge water from the West Ridge Mine will likely be similar to discharge from the Sunnyside Mines.

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TDS in Grassy Trail Creek at USGS station 0931430, at the mouth of Whitmore Canyon and near the upper contact with the Mancos Shale, averaged 988 mg/L between 1979 and 1984, with the dominant ions being sodium, sulfate, and bicarbonate (Waddell, 1981).

Grassy Trail Creek, the only perennial stream in the permit and adjacent areas, will be monitored at four locations. ST-3 is located below the confluence with Hanging Rock Canyon, and ST-8 is located just above the confluence with Water Canyon and downstream of the West Ridge Mine permit area and Grassy Trail Reservoir, ST-9 is located at the inlet of Grassy Trail Reservoir, and ST-10 is located at the uppermost permit boundary.

On the west side of West Ridge, five stations will monitor ephemeral drainages contributing to lower Grassy Trail Creek: ST-4 in lower Bear Creek; ST-5 below the confluence of B and C Canyons; ST-6A and ST-6, respectively above and below the mine site in C Canyon; and ST-7 in lower A Canyon. ST-4 will be simply visual observation of the channel for flowing water. ST-5 will have a crest gauge and an ISCO automatic sampler while ST-6A, ST-6 and ST-7 will each have a crest gauge and bottle samplers.

Surface water at ST-2 on upper Bear Creek is a magnesium-, bicarbonate-, and sulfate-type water with 1,100 mg/L TDS. Only one surface water sample was collected at M-2 on lower Bear Creek, and that sample had TDS of 1,820 mg/l. The quality of water in Bear Canyon appears to degrade rapidly as it flows between ST-2 and M-2, from the canyon into Clark Valley.

Both the B and C Canyon drainages respond as ephemeral drainages, but baseline observations at ST-5 indicate that all of the flow comes from the B Canyon drainage, primarily the lower drainages and adjacent Mancos slopes. ST-6 and ST-6A are located, respectively, below and above the proposed mine site in C Canyon. The crest gauges did not record any flow in the channel during baseline monitoring in 1997 or 1998 even though the rain gauge in C Canyon recorded precipitation events of up to two inches during that period. Based on monthly monitoring of ST-4 during 1997 and 1998, West Ridge Resources has determined that intermittent flow does not occur in the lower section of Bear Creek and that the channel responds only as an ephemeral drainage following substantial rainfall events.

If it becomes necessary to discharge water from the proposed mine, the water will discharge into the C Canyon drainage. In addition to being monitored at ST-5 and ST-6, discharged water will be subject to monthly monitoring stipulated by a UPDES permit. Because the monitoring required under the UPDES permit is more stringent and more frequent than that proposed in this permit application, discharge samples will be collected from the UPDES discharge monitoring point rather than at the drainage monitoring stations.

The West Ridge Mine UPDES permit contains limitations on TDS (one-ton/day), total suspended solids (30-day average, 25 mg/L; 7-day average, 35 mg/L; daily maximum, 70 mg/L), total settleable solids (0.5 ml/L for storm-water discharges), total iron (1.0 mg/L), oil and grease (10 mg/L), and pH (between 6.5 and 9.0). There is no limit on flow but it is to be measured monthly, and the duration of intermittent discharge is to be reported along with flow. Additionally, there can be no more than a trace amount of visible sheen, floating solids, or foam

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and no discharge of sanitary waste or coal process water. Monitoring is to be by monthly grab samples.

At and below the point of mine discharge into Soldier Creek, during periods of low flow, there is little apparent variation between water quality of the stream and the mine discharge because the mine discharge, which is fairly constant, produces most of the stream flow. During periods of high flow the effects of mine discharge to the stream are negligible with respect to sediment transport and water chemistry. A similar situation can be anticipated for the West Ridge Mine; however, the stream receiving the discharge is intermittent and there is no natural flow most of the year.

Waddell and others (1986) describe the stream bed characteristics of Soldier Creek in some detail. The stream appears to be naturally saturated with respect to calcite and the sediments in the bed become cemented with carbonate precipitates during the low-flow period in fall and winter. A new benthic environment is created when sediment is added or redistributed by the spring runoff. The diversity of benthic invertebrates varies seasonally because of these processes that alternately cement and disturb the sediment. The small, ephemeral drainages off the southwest escarpment at West Ridge probably do not flow for sufficient time to allow development of calcite cement in the substrate, and such drainages typically do not have benthic invertebrates.

(In 1989 Soldier Canyon Mine requested an increase in the daily limit on dissolved solids that could be discharged under the UPDES permit and Colorado River Salinity Standards because the inflow of ground water to the mine had increased to the point that dissolved solids flowing into the mine with the water exceeded 1 ton/day, which was the mine's UPDES discharge limit at that time. The current UPDES permit allows for Soldier Canyon Mine to discharge up to 5 tons of dissolved solids per day into Soldier Creek (total from all permitted outfalls). Maximum allowed TDS concentration is 1,200 mg/L. TDS concentrations have remained generally between 800 and 1,000 mg/L in recent years, but concentrations exceed 1,200 mg/L occasionally, and oil and grease occasionally have exceeded the UPDES limit also.)

West Ridge Mine Proposed Sediment Control

The West Ridge Mine MRP describes construction methods to be used and specific methods used to control sediment flow in C Canyon, an intermittent stream. One sediment pond, consisting of 3 cells, is to be used throughout mining operations. It will be constructed as soon as practical at the mine site during construction, but when reclamation of the mine yard is initiated, the sediment pond will be removed during removal of the bypass culvert and restoration of the natural channel through the site.

The sediment pond is designed for the complete retention of the 10 year, 24 hour storm event. The expected sediment from the mine yard disturbed area will be 0.3090 ac-ft/yr, and the sediment pond has been designed to handle the sediment yield from the disturbed area and retain it in the pond. This will effectively reduce the sediment yield from the disturbed area to an insignificant amount during the operational phase of the mine. Drainage from undisturbed areas will, for the most part, be carried under the mine site through a bypass culvert.

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The principal spillway will be a 24 inch cmp culvert in cell C, fitted with an oil skimmer. This spillway will carry the peak flow from the 25 year, 6 hour event at a depth of 1.05' over the pipe. The emergency spillway, to be located on cell B and constructed of concrete or grouted riprap, will convey any flow in excess of the 25 year, 6 hour precipitation event out of the pond. Both spillways will flow directly into the bypass culvert.

When the site has been regraded for reclamation, silt fences will be installed adjacent to the reclaimed channel, approximately along contour and with overlapping ends, to collect and contain sediment from the site. The surface of the regraded area will be gouged with a backhoe bucket to create large depressions that o act as sediment traps. The sediment yield from the reclaimed area is anticipated to be similar to adjacent undisturbed areas.

Alternate sediment control areas (ASCA) will be used in areas where the surface disturbance is minor and sediment control is expected to be restored fairly rapidly with revegetation. At the topsoil stockpiles ditches will divert undisturbed area runoff away from the stockpiles, silt fencing will be placed around the stockpiles to minimize siltation from the stockpile, the surface of the stockpiles will be pocked and roughened to retain moisture and minimize runoff, and the surface of the piles will be revegetated to minimize surface erosion. The office and parking lot area below the mine yard facility area will slope to one end, where silt fencing will be used for sediment control, and the slopes and embankment of the office pad will be revegetated to control sedimentation and erosion.

Water Quantity

Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. It will be monitored at four locations, at ST-3 located below the confluence with Hanging Rock Canyon and upstream of Grassy Trail Reservoir, at ST-8 located just above the confluence with Water Canyon and downstream of Grassy Trail Reservoir, at ST-9 as Grassy Trail Creek enters the reservoir, and ST-10 at the northernmost boundary where undisturbed Grassy Trail Creek enters the permit area. On the west side of West Ridge, five stations will monitor ephemeral drainages contributing to lower Grassy Trail Creek: ST-4 in lower Bear Creek; ST-5 below the confluence of B and C Canyons; ST-6A and ST-6, respectively above and below the mine site in C Canyon; and ST-7 in lower A Canyon. ST-4 will be simply visual observation of the channel for flowing water. ST-5 will have a crest gauge and an ISCO automatic sampler while ST-6A, ST-6 and ST-7 will each have a crest gauge and bottle samplers.

Both the B and C Canyon drainages respond as ephemeral drainages, but baseline observations at ST-5 indicate that all of the flow comes from the B Canyon drainage, primarily the lower drainages and adjacent Mancos slopes. ST-6 and ST-6A are located, respectively, below and above the proposed West Ridge Mine in C Canyon. The crest gauges did not record any flow in the channel during baseline monitoring in 1997 or 1998 even though the rain gauge in C Canyon recorded precipitation events of up to two inches during that period. Based on monthly monitoring of ST-4 during 1997 and 1998, intermittent flow does not occur in the lower section of Bear Creek and the channel responds only as an ephemeral drainage following substantial rainfall events.

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If it becomes necessary to discharge water from the West Ridge Mine, the water will discharge into the C Canyon drainage. In addition to being monitored at ST-5 and ST-6, discharged water will be subject to monthly monitoring stipulated by a UPDES permit. Because the monitoring required under the UPDES permit is more stringent and more frequent than that proposed in this permit application, discharge samples will be collected from the UPDES discharge monitoring point rather than at the drainage monitoring stations.

Water not used in the Soldier Canyon Mine or lost to evaporation is collected in an in-mine settling pond and discharged to Soldier Creek. The in-mine settling pond reduces suspended solids. Waddell (1986, Table 6) estimated that discharge for December 1980 was only 15 ac-ft, approximately 15 gpm. Discharge rates measured from 1987 to 1994 varied from about 200 gpm to 700 gpm and averaged 390 gpm (620 ac-ft/yr) (Soldier Canyon Mine MRP Appendix 7-3, p. 17). Discharge rates increased slightly over that seven year period.

Upon termination of mining operations, discharge of ground water from the Soldier Canyon Mine to Soldier Creek will be discontinued and the mine will begin to flood. There will be an initial reduction in surface flow because of the loss of the mine discharge. However, surface flow may recover to pre-mining conditions if base flow to the stream is reestablished as the mine floods. The time required for mine flooding will depend not only on the rate of water inflow but also on the amount of caving and the void space remaining after caving. Complete flooding of the mine may never occur because flow out of the mine through the roof, floor, and ribs and into the surrounding rock will increase as flooding increases the hydraulic head within the abandoned workings.

It is anticipated that discharge of water from the West Ridge Mine operation will be similar what has been observed or predicted at the Soldier Canyon Mine. Upon termination of mining operations at the West Ridge Mine, the mine will begin to flood and conditions can be expected to be similar to the Soldier Canyon Mine, except that pre-mining conditions will mean a return to intermittent flow, rather than perennial, in C Canyon.

ALLUVIAL VALLEY FLOORS

The West Ridge mine site would be the only surface disturbance within the permit area during the life of the mine. Factors are present within the permit area that would preclude the mine site, as well as the permit and adjacent areas including the substitute topsoil borrow area, from classification as alluvial valley floors.

VII. ASSESS PROBABLE MATERIAL DAMAGE.

The probable hydrologic impacts are summarized below under the headings entitled First Five Year Permit Term and Future Mining.

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SECOND FIVE YEAR PERMIT TERM - West Ridge Mine

At the time of this writing, the West Ridge Mine continues to have minimal inflow of water into the Mine. The rate of dewatering continues to be less than the estimated recharge rate. Overburden thickness will be sufficient (500 to 2,000 feet) to restrict surface manifestations of subsidence. Subsurface propagation of fractures may produce changes in ground-water flow that could affect local aquifers and springs, but there are no water rights, no significant springs, and currently no perennial streams over the mine area. Future monitoring will provide data applicable to documenting changes in the ground-water system.

Surface disturbance and the discharge to C Canyon are not expected to degrade water quality in Grassy Trail Creek or other drainages. Sediment control measures such as those intended for use at the West Ridge Mine have served to reduce contaminants and stabilize water quality at acceptable levels at Soldier Canyon Mine and at other mines in the Wasatch Plateau and Book Cliffs coal fields.

No AVF will be impacted during the first five year permit term by additional flow from increased mine water discharge.

FUTURE MINING

Increased rates of dewatering may in the future result in depletion of ground-water storage. Depletion of storage may terminate certain spring flows and base flow recharge to streams, in particular in Whitmore Canyon. Upon cessation of mining, mine water discharge will be discontinued. Mine flooding will probably result in reestablishment of the preexisting ground-water systems that, most likely, provided base flow to the streams.

Drainage from future surface disturbance will be managed through appropriate sediment controls. Future West Ridge Mine discharges will be directed through sediment ponds.

At the termination of mining, downstream potential AVF's will experience decreased flow as mine discharge stops. The duration and extent of this impact cannot be accurately assessed at this time. However, flow rates may be partially to fully restored when the ground-water system is reestablished by flooding of the abandoned mines.

The operational designs for the West Ridge Mine are determined, based on the information submitted in the mine plans and referenced literature, to be consistent with preventing damage to the hydrologic balance outside the mine plan areas.

VII. STATEMENT OF FINDINGS.

No probability of material damage from actual or anticipated mining operations has been found.

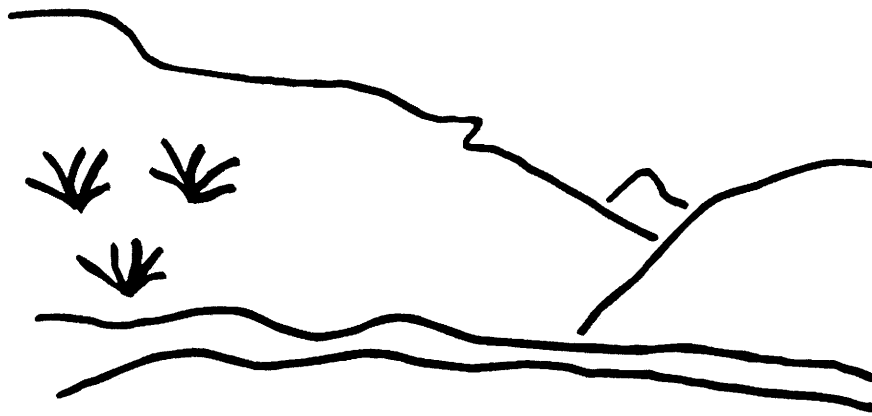
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State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

West Ridge Mine
Whitmore Canyon Extension
C/007/041-PM01H-1
Technical Analysis
February 12, 2002

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INTRODUCTION

TECHNICAL ANALYSIS

INTRODUCTION

On October 24, 2001, the Division received an application to add Federal Lease UTU-78562 to the permit area for the West Ridge Mine. The application is considered an extension to an existing permit and being processed under the guidelines of a new permit (per State Reg. R645-303.222). The application was determined to be Administratively Complete on December 12, 2001. Upon the Administratively Complete determination a technical review commenced. Additional information was received December 10 and December 24, 2001, and January 4, 2002. The application was returned to the Applicant on January 17, 2002, with deficiencies. The Division received the response to deficiencies on February 2, 2002. The following is a technical review of the entire Mine Reclamation Plan (MRP) as it pertains to the currently proposed modifications. All deficiencies cited in the January 17, 2002, Technical Analysis were adequately addressed in the February 2, 2002, submittal, with the exception of a stipulation to conduct a future wildlife survey as outlined. The application meets the minimum requirements of the State Regulations. Approval is recommended.

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February 12, 2002

INTRODUCTION

SUMMARY OF PERMIT CONDITIONS

SUMMARY OF PERMIT CONDITIONS

As determined in the analysis and findings of this Technical Analysis, approval of the plan is subject to the following Permit Conditions. The applicant is subject to compliance with the following Permit Conditions and has committed to comply with the requirements of these conditions as referenced in the approved Permit.

Accordingly, the permittee has committed to comply with the requirements of the following Permit Conditions, as specified, and in accordance with the requirements of:

R645-301-322, The permittee must conduct appropriate surveys for Mexican spotted owls on the lease tract areas with 40 percent or greater slopes, cliff habitat areas, riparian habitats, and mixed conifer forest habitats, prior to any future surface disturbing activity and/or any mining activity with the potential to interrupt surface spring flows. Inventory work must be conducted by parties approved and permitted for such survey work by the Fish and Wildlife Service and qualified in accordance with R645-301-132. Surveys must be done following current protocols established by the Fish and Wildlife Service.

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February 12, 2002

SUMMARY OF PERMIT CONDITIONS

GENERAL CONTENTS

GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

Minimum Regulatory Reference:

The operator of the coal mine and all owners and controllers of the operation must be identified by name and address. The Division with the Applicant/Violator System must crosscheck the information provided and other sources such as DOGM inspection and enforcement records, State corporation commission or tax records. If the Division identifies any errors in the ownership or control information, the applicant must be contacted to resolve the matter immediately. If the Division discovers that none of the persons identified in the application has had any previous mining experience, the applicant will be contacted to verify this fact.

The Applicant/Violator System will be updated with new information received by the Division.

Analysis:

The names and addresses of surface and subsurface owners are in Sections 112.500 and 112.600. Updated in the February 2, 2002 submittal, Maps 5-1 and 5-2 show land ownership information, and the text in Sections 112.500 and 112.600 is consistent with the maps and appears to be correct. After the applicant is notified that its application is approved but before the permit is issued, the applicant will need to update, correct, or indicate that no change has occurred in this information. In addition, the Division will need to check the ownership and control information in the applicant violator system (AVS).

Information provided in the application adequately addresses the requirements of the General Contents – Identification Of Interests section of the regulations.

VIOLATION INFORMATION

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

Analysis:

The applicant has updated the violation information in Appendix I-2. There are no unabated notices of violation or cessation orders. In accordance with regulation R645-301-113.400, after the applicant is notified that its application is approved, but before the permit is issued, the applicant will need to update, correct or indicate that no change has occurred in the information previously submitted under R645-301-113.

Findings:

Information provided in the proposal is adequate to meet the requirements of the General Contents – Violation Information section of the regulations

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Minimum Regulatory Reference:

Documents giving legal right to enter the permit area must be detailed in the application by date, type of document, land description and rights claimed. Any pending litigation over these legal rights must be disclosed.

The written consent of the landowner for the extraction of the coal by surface mining methods must also be included when the surface and mineral owners are different. Also a copy of the conveyance that grants the legal authority to extract the coal by surface methods will be included.

The Division does not have the authority to adjudicate property rights disputes.

Analysis:

The applicant bases its legal right to enter and begin mining and reclamation operations on language in federal coal leases SL-068754-U-01215 and the newly acquired lease SL-78562. In addition, the applicant has a lease with the School and Institutional Trust Lands Administration for a potential topsoil borrow area and other agreements with the Bureau of Land Management, so the total revised permit area would be 4307.63 acres. Legal descriptions of these leases and approval dates are shown in Table I-1. Legal descriptions for the other areas are in Table I-4.

The applicant has included in Chapter 1 right of entry information for the small part of the disturbed area extending south from the NE¼ NE¼ of Section 15, Township 14 South, Range 13 East and for the pumphouse in the NE¼ of Section 21 of this same township.

Findings:

Information provided in the proposal is adequate to meet the requirements of the General Contents section of the regulations.

GENERAL CONTENTS

LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Minimum Regulatory Reference:

The application will describe and identify the lands (on a map) subject to coal mining over the life of the operation, including the size, sequence, and timing of the mining anticipated and permit boundaries. Coal mining and reclamation operations may only occur on the lands identified on the maps submitted and that are subject to the performance bond.

A public notice advertisement will contain a map or description of the precise location and boundaries of the proposed permit area. So that local residents can identify the area, the map must have a north arrow and may include local landmarks.

Analysis:

Section R645-301-114 of the application describes the lands subject to coal mining by West Ridge Resources that holds 4297.01 acres of federal coal. Of this, 2650.67 acres is leased under lease SL-068754 and 1646.34 acres is leased under UTU-78562.

Updated in the February 2, 2002 submittal, the applicant has added Table I-4 that contains a legal description of the entire permit area, including some small areas outside the coal leases. This section also provides the size, location, and ownership of the lands mentioned. The Division is unaware of any petition to designate the area as unsuitable for mining.

Findings:

Information provided in the application provides the information on lands subject to coal mining, and is adequate to meet the requirements of the General Contents – Legal Description and Status of Unsuitability Claims section of the regulations.

PERMIT TERM

Regulatory References: 30 CFR 778.17; R645-301-116.

Minimum Regulatory Reference:

The application will describe and identify the lands (on a map) subject to coal mining over the life of the operation, including the size, sequence, and timing of the mining anticipated and permit boundaries. Coal mining and reclamation operations may only occur on the lands identified on the maps submitted and that are subject to the performance bond.

A public notice advertisement will contain a map or description of the precise location and boundaries of the proposed permit area. So that local residents can identify the area, the map must have a north arrow and may include local landmarks.

Analysis:

The applicant has not requested a change in the permit term. The current permit will expire April 1, 2004.

Findings:

Information provided in the application is adequate to meet the requirements of the General Contents – Permit Term section of the regulations.

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Minimum Regulatory Reference

After the application has been determined "administratively complete," an advertisement must be placed in a local newspaper of general circulation in the locality of the proposed surface coal mining and reclamation operation at least once a week for four consecutive weeks. A copy of the advertisement as it will appear in the newspaper will be submitted to the regulatory authority.

At a minimum, the following will be included in the ad:

- (1) The name and business address of the applicant.
- (2) A map or description.
- (3) The location where a copy of the application is available for public inspection.
- (4) The name and address of the Division where written comments, objections, or requests for informal conferences on the application may be submitted.
- (5) If an applicant seeks a permit to mine within 100 feet of the outside right-of-way of a public road or to relocate or close a public road, except where public notice and hearing have previously been provided for this particular part of the road; a concise statement describing the public road, the particular part to relocated or closed, and the approximate timing and duration of the relocation or closing.
- (6) If the application includes a request for an experimental practice, a statement indicating that an experimental practice is requested and identifying the regulatory provisions for which a variance is requested.

The Division will notify in writing local governmental agencies and all Federal or State governmental agencies involved in or with an interest in the permit process.

Documentation of the public notice and comment period required for the Permit should be incorporated as part of the Permit.

Analysis:

Updated in the February 2, 2002 submittal, the application includes a copy of the proof of publication. The advertisement was published December 13, 18, 20, and 25, 2001, and January 1, 2002. The public comment period ended January 30, 2002, and the Division received no comments.

GENERAL CONTENTS

Findings:

The applicant has published a notice as required. Therefore, the information provided in the application is adequate to meet the requirements of the General Contents – Public Notice and Comment section of the regulations.

FILING FEE

Regulatory Reference: 30 CFR 777.17; R645-301-118.

Analysis:

A filing fee was collected during the initial application for permitting the West Ridge Mine. A new filing fee is not required for the addition of a new coal lease to the approved permit area (see Division Directive Adm-003).

Findings:

A filing fee is not applicable for the current application.

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

Updated in the February 2, 2002 submittal, items cited during the initial review as needing typographical changes were modified by the applicant. No additional typographical/completeness items were cited during the current review.

Findings:

The application was found to be complete. Therefore, information provided in the application is adequate to meet the requirements of the General Contents – Completeness section of the regulations.

ENVIRONMENTAL RESOURCE INFORMATION

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Minimum Regulatory Requirements:

Include a description of the existing, pre-mining environmental resources within the proposed permit area and adjacent areas that may be affected or impacted by the proposed underground mining activities.

Analysis:

Due to the associated permit boundary change with the addition of Federal Lease UTU-78562, the majority of maps were modified to the lease as the new/proposed permit boundary. Appendix 5-3, the Resource Recovery and Protection Plan (R2P2), provides the respective maps (Plates 1 – 12) and illustrate the modifications.

Findings:

The appropriate description exists in the permit, therefore the information provided in the application is adequate to meet the requirements of the Environmental Resource Information - General Information section of the regulations.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Minimum Regulatory Requirements:

Describe and identify the lands subject to surface coal mining operations over the estimated life of those operations and the size, sequence, and timing of the subareas for which it is anticipated that individual permits for mining will be sought.

Analysis:

The Applicant will add lease UTU-78562 containing 1646.34 acres, also known as the Whitmore lease. A legal description of the lease is given in Table I-1 of the application.

Findings:

The lands suitable to coal mining have been identified in the application in Table I-1, therefore, the application adequately addresses the minimum requirements of the General – Permit Area section of the regulations.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.12; R645-301-411.

Minimum Regulatory Requirements:

Describe and identify the nature of cultural historic and archeological resources listed or eligible for listing on the National Register of Historic Places and known archeological sites within the proposed permit and adjacent areas. The description shall be based on all available information, including, but not limited to, information from the State Historic Preservation Officer and local archeological, historical, and cultural preservation groups.

Identify and evaluate important historic and archeological resources that may be eligible for listing on the National Register of Historic Places, through the collection of additional information, conduct of field investigations, or other appropriate analyses.

Analysis:

The current mining and reclamation plan contains summary information from several archaeological surveys conducted in the area in appendixes 4-1 through 4-3. Two cultural resource sites were found in the proposed addition to the permit area, but neither of these was considered significant. There is one site just outside the proposed addition that was not evaluated for historical significance, but the consultant conducting the survey recommended that it be considered eligible until an evaluation could be done.

The application is required to contain maps as described under R645-301-411.141 and a supporting narrative which describes the nature of cultural and historic resources listed or eligible for listing in the National Register of Historic Places and known archaeological sites within the permit and adjacent areas. The description will be based on all available information, including, but not limited to, information from the State Historic Preservation Officer and from local archeological, historic, and cultural preservation agencies. The applicant has researched available cultural resource information and included it in the application as required.

Findings:

Information provided in the application is adequate to meet the requirements of the Historic and Archaeological Resource Information section of the regulations.

ENVIRONMENTAL RESOURCE INFORMATION

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Minimum Regulatory Requirements:

Provide a statement of the climatological factors that are representative of the proposed permit area, including: the average seasonal precipitation; the average direction and velocity of prevailing winds; and, seasonal temperature ranges. Additional data may be requested as deemed necessary to ensure compliance other regulatory requirements.

Analysis:

No changes or modifications were necessary to the currently approved MRP since the same climatological parameters exist for the new lease.

Findings:

information provided in the application is adequate to meet the requirements of the Climate Resource Information section of the regulations.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Minimum Regulatory Requirements:

Provide a map that delineates existing vegetative types and a description of the plant communities within the area affected by surface operations and facilities and within any proposed reference area. The description shall include information adequate to predict the potential for reestablishing vegetation. The map or aerial photograph is required, sufficient adjacent areas shall be included to allow evaluation of vegetation as important habitat for fish and wildlife for those species of fish and wildlife as identified under the fish and wildlife resource information.

Analysis:

For an increase in the permit area with no surface disturbance, the Division usually requires only general information about the vegetation communities in the new area. A map showing the vegetation communities in this area is generally sufficient.

The applicant has updated Map 3-1, General Vegetation Communities, to show the proposed addition to the permit area. Updated in the February 2, 2002 submittal, the new lease includes aspen and riparian vegetation communities in addition to the communities already shown on the map in the current plan.

Also updated in the February 2, 2002 submittal, the application includes a proposal to undermine portions of Grassy Trail Creek, and the applicant has committed to gather qualitative vegetation data about this area in 2002. In addition, in Section R645-301-332 of the current

ENVIRONMENTAL RESOURCE INFORMATION

mining and reclamation plan, a commitment to monitor the effects of underground mining on vegetation through infrared photography is included. The mine plan indicates the applicant will not mine under Grass Trail Creek until 2006, so the monitoring schedule in the application gives adequate time to gather appropriate baseline data.

Findings:

Information provided in the application is adequate to meet the requirements of the Vegetation Resource Information section of the regulations.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

Minimum Regulatory Reference:

The application shall include fish and wildlife resource information for the permit area and adjacent area. The scope and level of detail for such information shall be determined by the Division in consultation with State and Federal agencies with responsibilities for fish and wildlife and shall be sufficient to design the protection and enhancement plan required under the operation and reclamation plan.

Site-specific resource information necessary to address the respective species or habitats shall be required when the permit area or adjacent area is likely to include:

- (1) Listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), or those species or habitats protected by similar State statutes;
- (2) Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering areas; or
- (2) Other species or habitats identified through agency consultation as requiring special protection under State or Federal law.

Analysis:

Fish and Wildlife Information

The Division has consulted with the Division of Wildlife Resources about fish and wildlife information requirements, and their comments are addressed below.

Map 3-4A shows raptor nesting information, and it has been revised to show the proposed addition to the permit area. This map does not show any raptor nests in the proposed addition. Updated in the February 2, 2002 submittal, an attached letter from the Division of Wildlife Resources indicates the lease area was surveyed for raptors in 1999, and the map accompanying this letter indicates a red-tailed hawk nest and a great horned owl nest were found in the area. The applicant has committed to conduct raptor surveys within one year of any proposed mining activity that could result in subsidence (Section R645-301-333).

ENVIRONMENTAL RESOURCE INFORMATION

According to revised Maps 3-4B, 3-4C, and 3-4D, the entire proposed addition to the permit area contains critical deer summer range and high value elk year long range, but it does not contain habitat for pronghorns.

Based on information from the Division of Wildlife Resources, the Division understands the Right Fork of Grassy Trail Creek, the fork the applicant plans to undermine, could not support a fishery; therefore, no information about the aquatic habitat in this area is required.

Updated in the February 2, 2002 submittal, the application contains a discussion about bat species that might occur in the area and how these might be adversely affected. None of the species in the area roosts in large colonies, and it would be extremely difficult for a person to find roosting sites in rock cavities or trees. Even if these sites could be found, it would be nearly impossible to protect them. Some individuals could be killed by subsidence, but this should not have a major affect on local populations. For these reasons, further information is not required.

The Division of Wildlife Resources considers the springs and other sources of free water in the area to be very important, and the applicant has been monitoring springs for baseline data and has committed to continue monitoring them. The Division considers this to be adequate.

Threatened and Endangered Species

On January 2, 2002, the Division received a letter from the Fish and Wildlife Service listing ten species that may occur in the area of influence of the proposed project. Some of these species were discussed in the original technical analysis for the West Ridge Mine with determinations that the area either contains no habitat or that the mine will have no effects. Those species that should not be affected and that were addressed in the original technical analysis are Graham beardtongue, bald eagle, and the black-footed ferret. Other species mentioned in the Fish and Wildlife Service letter are discussed below.

According to the *Utah Endangered, Threatened and Sensitive Plant Field Guide*, the Uinta Basin hookless cactus, *Sclerocactus glaucus*, grows in gravelly hills and terraces on Quaternary and Tertiary alluvium soils in cold desert shrub communities between 4700 and 6000 feet. The lowest elevation in the proposed addition to the permit area is about 7500 feet, and the soils are derived from Cretaceous deposits. There are no desert shrub communities within the area. The proposed addition to the permit area does not contain habitat for this species.

The application includes a letter from Chris Colt of the Division of Wildlife Resources saying he and another wildlife biologist surveyed most of the proposed addition to the permit area looking for potential Mexican spotted owl habitat. They do not feel the east-facing slope of Whitmore Canyon contains suitable habitat for Mexican spotted owls or that mining in these areas will adversely affect this species. The letter specifically says the Wildlife Resources employees do not feel mining in Section 1 and 12, Township 14 South, Range 13 East, and

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Section 35, Township 13 South, Range 13 East, will affect Mexican spotted owls. The areas included in the habitat survey and the areas in the sections mentioned covers the entire proposed addition to the permit area.

Updated since the February 2, 2002 submittal, David Mills, a wildlife biologist with the Bureau of Land Management, has decided that limited restricted habitat potentially occurs within the lease tract. The area is potential foraging habitat and marginal nesting and roosting habitat. For this reason, the Bureau of Land Management has put a stipulation on the lease requiring surveys for Mexican spotted owls prior to surface-disturbing activity in riparian areas, areas with slopes greater than 40 percent, mixed conifer forest habitats, and cliff habitat areas. The stipulation also includes monitoring for owls in areas where mining could disrupt spring flows. The Division is including a similar stipulation in its permit.

Because the applicant has not proposed any activities that would disturb the surface, the only concern at this time is to monitor for owls near springs that could be disrupted. The applicant may want to begin this monitoring soon since it takes two years of monitoring to determine there are no Mexican spotted owls in an area.

The western yellow-billed cuckoo requires dense lowland riparian habitat. Updated in the February 2, 2002 submittal the application includes correspondence from the Division of Wildlife Resources indicating the riparian habitat in Whitmore Canyon is not likely to support a breeding population of yellow-billed cuckoos. They recommended that a survey not be done for this species.

Findings:

With the exception of the stipulation outlined below, all other information provided in the application is adequate to meet the requirements of the Fish and Wildlife Resource Information section of the regulations. The permit needs to include the following stipulation:

R645-301-322, The permittee must conduct appropriate surveys for Mexican spotted owls on the lease tract areas with 40 percent or greater slopes, cliff habitat areas, riparian habitats, and mixed conifer forest habitats, prior to any future surface disturbing activity and/or any mining activity with the potential to interrupt surface spring flows. Inventory work must be conducted by parties approved and permitted for such survey work by the Fish and Wildlife Service and qualified in accordance with R645-301-132. Surveys must be done following current protocols established by the Fish and Wildlife Service.

SOILS RESOURCE INFORMATION

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Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Minimum Regulatory Requirements:

Provide adequate soil survey information on those portions of the permit area to be affected by surface operations or facilities consisting of a map delineating different soils, soil identification, soil description, and present and potential productivity of existing soils.

Where selected overburden materials are proposed as a supplement or substitute for topsoil, provide results of the analysis, trials and tests required. Results of physical and chemical analyses of overburden and topsoil must be provided to demonstrate that the resulting soil medium is equal to or more suitable for sustaining revegetation than the available topsoil, provided that trials and tests are certified by an approved laboratory. These data may be obtained from any one or a combination of the following sources: U.S. Department of Agriculture Soil Conservation Service published data based on established soil series; U.S. Department of Agriculture Soil Conservation Service Technical Guides; State agricultural agency, university, Tennessee Valley Authority, Bureau of Land Management or U.S. Department of Agriculture Forest Service published data based on soil series properties and behavior; or, results of physical and chemical analyses, field site trials, or greenhouse tests of the topsoil and overburden materials (soil series) from the permit area. If the permittee demonstrates through soil survey or other data that the topsoil and unconsolidated material are insufficient and substitute materials will be used, only the substitute materials must be analyzed.

Analysis:

No additional surface disturbance is associated with the current proposal of adding Federal Lease UTU-78562 to the permit area. No modification to the current MRP is required.

Findings:

Information in the currently approved MRP is adequate to meet the Soils Resource Information requirements of the regulations.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.22; R645-301-411.

Minimum Regulatory Requirements:

Provide a statement of the condition; capability, and productivity of the land that will be affected by surface operations and facilities within the proposed permit area.

Provide a map and supporting narrative of the uses of the land existing at the time of the filing of the application. If the premining use of the land was changed within 5 years before the anticipated date of beginning the proposed operations, the historic use of the land shall also be described.

The narrative of land capability and productivity must include the capability of the land before any mining to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover, and the hydrology of the area proposed to be affected by surface operations or facilities.

Describe the productivity of the area proposed to be affected by surface operations and facilities before mining; expressed as average yield of food, fiber, forage, or wood products from such lands obtained under high levels of management. The productivity shall be determined by yield data or estimates for similar sites based on current data from the U.S. Department of Agriculture, State agricultural universities, or appropriate State natural resources or agricultural agencies.

The application must state whether the proposed permit area has been previously mined. If so, provide the following information, if available: the type of mining method used; the coal seams or other mineral strata mined; the extent of coal or other

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minerals removed; the approximate dates of past mining; and, the uses of the land preceding mining.

The application shall provide a description of the existing land uses and land-use classifications under local law, if any, of the proposed permit and adjacent areas.

Analysis:

The application includes no changes to the text of the land use resource information section of the plan due to no increase in the size of the surface facilities. The Land-use resource information specifically addresses the land that will be affected by surface operations and facilities. These land uses are grazing and wildlife habitat. Map 4-1 has been revised to show land uses and water rights in the proposed addition to the permit area. The surface of some of the new area is within a grazing allotment, but most of it is either private land or is not allotted. The current mining and reclamation plan indicates the permit area contains no land within the Wild and Scenic Rivers System, the National System of Trails, or within 100 feet of a cemetery.

Findings

Information in the application is adequate to meet the Land Use Resource Information requirements of the regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Minimum Regulatory Requirements:

This section applies to surface coal mining and reclamation operations on areas or adjacent to areas including alluvial valley floors in the arid and semiarid areas west of the 100th meridian.

Alluvial valley floor determination

Permit applicants who propose to conduct surface coal mining and reclamation operations within a valley holding a stream or in a location where the permit area or adjacent area includes any stream, in the arid and semiarid regions of the United States, as an initial step in the permit process, may request the Division to make an alluvial valley floor determination with respect to that valley floor. The applicant shall demonstrate and the Division shall determine, based on either available data or field studies submitted by the applicant, or a combination of available data and field studies, the presence or absence of an alluvial valley floor. Studies shall include sufficiently detailed geologic, hydrologic, land use, soils, and vegetation data and analysis to demonstrate the probable existence of an alluvial valley floor in the area. The Division may require additional data collection and analysis or other supporting documents, maps, and illustrations in order to make the determination.

The Division shall make a written determination as to the extent of any alluvial valley floors within the area. The Division shall determine that an alluvial valley floor exists if it finds that unconsolidated streamlaid deposits holding streams are present; and there is sufficient water available to support agricultural activities as evidenced by the existence of current flood irrigation in the area in question; the capability of an area to be flood irrigated, based on evaluations of streamflow, water quality, soils, and topography; or, subirrigation of the lands in question derived from the ground-water system of the valley floor.

If the Division determines in writing that an alluvial valley does not exist pursuant to the requirements of this section, no further consideration of this section is required.

Applicability of statutory exclusions

If an alluvial valley floor is identified and the proposed surface coal mining operation may affect this alluvial valley floor or

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waters that supply the alluvial valley floor, the applicant may request the Division, as a preliminary step in the permit application process, to separately determine the applicability of the statutory exclusions set forth in this section. The Division may make such a determination based on the available data, may require additional data collection and analysis in order to make the determination, or may require the applicant to submit a complete permit application and not make the determination until after the complete application is evaluated.

An applicant need not submit the information required and the Division is not required to make the findings required of this section when the Division determines that one of the following circumstances, heretofore called statutory exclusions, exist:

1. The premining land use is undeveloped rangeland that is not significant to farming;
2. Any farming on the alluvial valley floor that would be affected by the surface coal mining operation is of such small acreage as to be of negligible impact on the farm's agricultural production. Negligible impact of the proposed operation on farming will be based on the relative importance of the affected farmland areas of the alluvial valley floor area to the farm's total agricultural production over the life of the mine; or,
3. The circumstances set forth in Section 822.12(b)(3) or (4) of this Chapter exist.

For the purpose of this section, a farm is one or more land units on which farming is conducted. A farm is generally considered to be the combination of land units with acreage and boundaries in existence prior to August 3, 1977, or if established after August 3, 1977, with those boundaries based on enhancement of the farm's agricultural productivity and not related to surface coal operations.

(c) Summary denial. If the Division determines that the statutory exclusions are not applicable and that any of the required findings of Paragraph (e)(2) of this section cannot be made, the Division may, at the request of the applicant:

(1) Determine that mining is precluded on the proposed permit area and deny the permit without the applicant filing any additional information required by this section; or

(2) Prohibit surface coal mining and reclamation operations in all or parts of the area to be affected by mining.

(d) Application contents for operations affecting designated alluvial valley floors. (1) If land within the permit area or adjacent area is identified as an alluvial valley floor and the proposed surface coal mining operation may affect an alluvial valley floor or waters supplied to an alluvial valley floor, the applicant shall submit a complete application for the proposed surface coal mining and reclamation operations to be used by the Division together with other relevant information as a basis for approval or denial of the permit. If an exclusion of Paragraph (b)(2) of this section applies, then the applicant need not submit the information required in Paragraphs (d)(2)(ii) and (iii) of this section.

(2) The complete application shall include detailed surveys and baseline data required by the Division for a determination of--

(i) The essential hydrologic functions of the alluvial valley floor which might be affected by the mining and reclamation process. The information required by this subparagraph shall evaluate those factors which contribute to the collecting, storing, regulating and making the natural flow of water available for agricultural activities on the alluvial valley floor and shall include, but are not limited to:

(A) Factors contributing to the function of collecting water, such as amount, rate and frequency of rainfall and runoff, surface roughness, slope and vegetative cover, infiltration, and evapotranspiration, relief, slope and density of drainage channels;

(B) Factors contributing to the function of storing water, such as permeability, infiltration, porosity, depth and direction of ground water flow, and water holding capacity;

(C) Factors contributing to the function of regulating the flow of surface and ground water, such as the longitudinal profile and slope of the valley and channels, the sinuosity and cross-sections of the channels, interchange of water between streams and associated alluvial and bedrock aquifers, and rates and amount of water supplied by these aquifers; and

(D) Factors contributing to water availability, such as the presence of flood plains and terraces suitable for agricultural activities.

(ii) Whether the operation will avoid during mining and reclamation the interruption, discontinuance, or preclusion of farming on the alluvial valley floor;

(iii) Whether the operation will cause material damage to the quantity or quality of surface or ground waters supplied to the alluvial valley floor;

(iv) Whether the reclamation plan is in compliance with requirements of the Act, this Chapter, and regulatory program; and

(v) Whether the proposed monitoring system will provide sufficient information to measure compliance with Part 822 of this Chapter during and after mining and reclamation operations.

(e) Findings. (1) The findings of Paragraphs (e)(2)(i) and (ii) of this section are not required with regard to alluvial valley floors to which are applicable any of the exclusions of Paragraph (b)(2) of this section.

(2) No permit or permit revision application for surface coal mining and reclamation operations on lands located west of the 100th meridian west longitude shall be approved by the Division unless the application demonstrates and the Division finds in writing, on the basis of information set forth in the application, that

(i) The proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor;

(ii) The proposed operations will not materially damage the quantity or quality of water in surface and underground water systems that supply alluvial valley floors; and

(iii) The proposed operations will comply with Part 822 of this Chapter and the other applicable requirements of the Act

and the regulatory program.

Analysis:

Alluvial Valley Floor Determination

Additional information was requested to supplement the information available in Chapter 2 of the approved MRP. Updated in the February 2, 2002 submittal, the applicant has provided supplemental information to the data supplied in Chapter 2 of the approved MRP for the Alluvial valley floor determination in Whitmore Canyon. On Page 2-21, the applicant has stated that no alluvial valley floors exist in the permit area or adjacent area, and refers to appendix 2-7. Appendix 2-7 is a letter, by a certified professional geologist, outlining the investigation that was conducted which supported the finding that no alluvial valley floor exists in Whitmore Canyon.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Environmental Resource Information – Alluvial Valley Floors section of the regulations.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Minimum Regulatory Requirements:

The U.S. Soil Conservation Service within each State shall establish specifications for prime farmland soil removal, storage, replacement, and reconstruction. The Division shall use the soil-reconstruction specifications to carry out its responsibilities under this section.

The requirements of this part shall not apply to:

Note: This section is suspended "insofar as it excludes from the requirements of Prime Farmlands those coal preparation plants, support facilities, and roads that are surface mining activities".

- (1) Coal preparation plants, support facilities, and roads of surface and underground mines that are actively used over extended periods of time and where such uses affect a minimal amount of land.
- (2) Disposal areas containing coal mine waste resulting from underground mines that is not technologically and economically feasible to store in underground mines or on non-prime farmland. The operator shall minimize the area of prime farmland used for such purposes.
- (3) Prime farmland that has been excluded in accordance with any valid existing rights as indicated below.

This section applies to any person who conducts or intends to conduct surface coal mining and reclamation operations on prime farmland historically used for cropland. This section does not apply to:

- (1) Lands on which surface coal mining and reclamation operations are conducted pursuant to any permit issued prior to August 3, 1977; or
- (2) Lands on which surface coal mining and reclamation operations are conducted pursuant to any renewal or revision of a permit issued prior to August 3, 1977; or
- (3) Lands included in any existing surface coal mining operations for which a permit was issued for all or any part thereof prior to August 3, 1977, provided that: such lands are part of a single continuous surface coal mining

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operation begun under a permit issued before August 3, 1977; and the permittee had a legal right to mine the lands prior to August 3, 1977, through ownership, contract, or lease but not including an option to buy, lease, or contract; and the lands contain part of a continuous recoverable coal seam that was being mined in a single continuous mining pit (or multiple pits if the lands are proven to be part of a single continuous surface coal mining operation) begun under a permit issued prior to August 3, 1977.

For purposes of this section, renewal of a permit means a decision by the Division to extend the time by which the permittee may complete mining within the boundaries of the original permit, and revision of the permit means a decision by the Division to allow changes in the method of mining operations within the original permit area, or the decision of the Division to allow incidental boundary changes to the original permit. A pit shall be deemed to be a single continuous mining pit even if portions of the pit are crossed by a road, pipeline, railroad, or power line or similar crossing. A single continuous surface coal mining operation is presumed to consist only of a single continuous mining pit under a permit issued prior to August 3, 1977, but may include non-contiguous parcels if the operator can prove by clear and convincing evidence that, prior to August 3, 1977, the non-contiguous parcels were part of a single permitted operation. For the purposes of this paragraph, clear and convincing evidence includes, but is not limited to, contracts, leases, deeds or other properly executed legal documents (not including options) that specifically treat physically separate parcels as one surface coal mining operation.

All permit applications, whether or not prime farmland is present, shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists. The Division in consultation with the U.S. Soil Conservation Service shall determine the nature and extent of the required reconnaissance inspection.

If the reconnaissance inspection establishes that no land within the proposed permit area is prime farmland historically used for cropland, the applicant shall submit a statement that no prime farmland is present. The statement shall identify the basis upon which such a conclusion was reached.

If the reconnaissance inspection indicates that land within the proposed permit area may be prime farmland historically used for croplands, the applicant shall determine if a soil survey exists for those lands and whether soil mapping units in the permit area have been designated as prime farmland. If no soil survey exists, the applicant shall have a soil survey made of the lands within the permit area which the reconnaissance inspection indicates could be prime farmland. Soil surveys of the detail used by the U.S. Soil Conservation Service for operational conservation planning shall be used to identify and locate prime farmland soils.

If the soil survey indicates that no prime farmland soils are present within the proposed permit area, the plan shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists.

Analysis:

No additional surface facilities disturbance is associated with the current proposal of adding Federal Lease UTU-78562 to the permit area. No modification to the current MRP is required.

Findings:

Information in the application is adequate to meet the Prime Farmland Information requirements of the regulations.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Minimum Regulatory Requirements:

Each application shall include geologic information in sufficient detail to assist in: determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary; determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined; determining whether reclamation can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and, preparing the subsidence control plan.

Geologic information shall include, at a minimum, a description of the geology of the proposed permit and adjacent areas down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. This description shall include the areal and structural geology of the permit and adjacent areas, and other parameters which influence the required reclamation and it shall also show how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. It shall be based on maps and plans required as resource information for the plan, detailed site specific information as required below, and, geologic literature and practices.

For any portion of a permit area in which the strata down to the coal seam to be mined will be removed or are already exposed, samples shall be collected and analyzed from test borings; drill cores; or fresh, unweathered, uncontaminated samples from rock outcrops down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The analyses shall result in the following:

- (1) Logs showing the lithologic characteristics including physical properties and thickness of each stratum and location of ground water where occurring;
- (2) Chemical analyses identifying those strata that may contain acid- or toxic-forming, or alkalinity-producing materials and to determine their content, except that the Division may find that the analysis for alkalinity-producing material is unnecessary; and
- (3) Chemical analysis of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the Division may find that the analysis of pyritic sulfur content is unnecessary.

For lands within the permit and adjacent areas where the strata above the coal seam to be mined will not be removed, samples shall be collected and analyzed from test borings or drill cores to provide the following data:

- (1) Logs of drill holes showing the lithologic characteristics, including physical properties and thickness of each stratum that may be impacted, and location of ground water where occurring;
- (2) Chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined;
- (3) Chemical analyses of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the Division may find that the analysis of pyrite sulfur content is unnecessary; and
- (4) For standard room-and-pillar mining operations, the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined.

If determined to be necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards, the Division may require the collection, analysis, and description of additional geologic information.

An applicant may request the Division to waive in whole or in part the requirements of the borehole information or analysis required of this section. The waiver may be granted only if the Division finds in writing that the collection and analysis of such data are unnecessary because other information having equal value or effect is available to the Division in a satisfactory form.

Analysis:

The geologic coverage of the area is already sufficiently addressed in the current MRP. Maps 6-1, 6-2, and 6-3 (Regional Geology, Coal Seam Structure, and Lower Sunnyside Coal

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waters that supply the alluvial valley floor, the applicant may request the Division, as a preliminary step in the permit application process, to separately determine the applicability of the statutory exclusions set forth in this section. The Division may make such a determination based on the available data, may require additional data collection and analysis in order to make the determination, or may require the applicant to submit a complete permit application and not make the determination until after the complete application is evaluated.

An applicant need not submit the information required and the Division is not required to make the findings required of this section when the Division determines that one of the following circumstances, heretofore called statutory exclusions, exist:

1. The premining land use is undeveloped rangeland that is not significant to farming;
2. Any farming on the alluvial valley floor that would be affected by the surface coal mining operation is of such small acreage as to be of negligible impact on the farm's agricultural production. Negligible impact of the proposed operation on farming will be based on the relative importance of the affected farmland areas of the alluvial valley floor area to the farm's total agricultural production over the life of the mine; or,
3. The circumstances set forth in Section 822.12(b)(3) or (4) of this Chapter exist.

For the purpose of this section, a farm is one or more land units on which farming is conducted. A farm is generally considered to be the combination of land units with acreage and boundaries in existence prior to August 3, 1977, or if established after August 3, 1977, with those boundaries based on enhancement of the farm's agricultural productivity and not related to surface coal operations.

(c) Summary denial. If the Division determines that the statutory exclusions are not applicable and that any of the required findings of Paragraph (e)(2) of this section cannot be made, the Division may, at the request of the applicant:

(1) Determine that mining is precluded on the proposed permit area and deny the permit without the applicant filing any additional information required by this section; or

(2) Prohibit surface coal mining and reclamation operations in all or parts of the area to be affected by mining.

(d) Application contents for operations affecting designated alluvial valley floors. (1) If land within the permit area or adjacent area is identified as an alluvial valley floor and the proposed surface coal mining operation may affect an alluvial valley floor or waters supplied to an alluvial valley floor, the applicant shall submit a complete application for the proposed surface coal mining and reclamation operations to be used by the Division together with other relevant information as a basis for approval or denial of the permit. If an exclusion of Paragraph (b)(2) of this section applies, then the applicant need not submit the information required in Paragraphs (d)(2)(ii) and (iii) of this section.

(2) The complete application shall include detailed surveys and baseline data required by the Division for a determination of--

(i) The essential hydrologic functions of the alluvial valley floor which might be affected by the mining and reclamation process. The information required by this subparagraph shall evaluate those factors which contribute to the collecting, storing, regulating and making the natural flow of water available for agricultural activities on the alluvial valley floor and shall include, but are not limited to:

(A) Factors contributing to the function of collecting water, such as amount, rate and frequency of rainfall and runoff, surface roughness, slope and vegetative cover, infiltration, and evapotranspiration, relief, slope and density of drainage channels;

(B) Factors contributing to the function of storing water, such as permeability, infiltration, porosity, depth and direction of ground water flow, and water holding capacity;

(C) Factors contributing to the function of regulating the flow of surface and ground water, such as the longitudinal profile and slope of the valley and channels, the sinuosity and cross-sections of the channels, interchange of water between streams and associated alluvial and bedrock aquifers, and rates and amount of water supplied by these aquifers; and

(D) Factors contributing to water availability, such as the presence of flood plains and terraces suitable for agricultural activities.

(ii) Whether the operation will avoid during mining and reclamation the interruption, discontinuance, or preclusion of farming on the alluvial valley floor;

(iii) Whether the operation will cause material damage to the quantity or quality of surface or ground waters supplied to the alluvial valley floor;

(iv) Whether the reclamation plan is in compliance with requirements of the Act, this Chapter, and regulatory program; and

(v) Whether the proposed monitoring system will provide sufficient information to measure compliance with Part 822 of this Chapter during and after mining and reclamation operations.

(e) Findings. (1) The findings of Paragraphs (e)(2)(i) and (ii) of this section are not required with regard to alluvial valley floors to which are applicable any of the exclusions of Paragraph (b)(2) of this section.

(2) No permit or permit revision application for surface coal mining and reclamation operations on lands located west of the 100th meridian west longitude shall be approved by the Division unless the application demonstrates and the Division finds in writing, on the basis of information set forth in the application, that

(i) The proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor;

(ii) The proposed operations will not materially damage the quantity or quality of water in surface and underground water systems that supply alluvial valley floors; and

(iii) The proposed operations will comply with Part 822 of this Chapter and the other applicable requirements of the Act

and the regulatory program.

Analysis:

Alluvial Valley Floor Determination

Additional information was requested to supplement the information available in Chapter 2 of the approved MRP. Updated in the February 2, 2002 submittal, the applicant has provided supplemental information to the data supplied in Chapter 2 of the approved MRP for the Alluvial valley floor determination in Whitmore Canyon. On Page 2-21, the applicant has stated that no alluvial valley floors exist in the permit area or adjacent area, and refers to appendix 2-7. Appendix 2-7 is a letter, by a certified professional geologist, outlining the investigation that was conducted which supported the finding that no alluvial valley floor exists in Whitmore Canyon.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Environmental Resource Information – Alluvial Valley Floors section of the regulations.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Minimum Regulatory Requirements:

The U.S. Soil Conservation Service within each State shall establish specifications for prime farmland soil removal, storage, replacement, and reconstruction. The Division shall use the soil-reconstruction specifications to carry out its responsibilities under this section.

The requirements of this part shall not apply to:

Note: This section is suspended "insofar as it excludes from the requirements of Prime Farmlands those coal preparation plants, support facilities, and roads that are surface mining activities".

- (1) Coal preparation plants, support facilities, and roads of surface and underground mines that are actively used over extended periods of time and where such uses affect a minimal amount of land.
- (2) Disposal areas containing coal mine waste resulting from underground mines that is not technologically and economically feasible to store in underground mines or on non-prime farmland. The operator shall minimize the area of prime farmland used for such purposes.
- (3) Prime farmland that has been excluded in accordance with any valid existing rights as indicated below.

This section applies to any person who conducts or intends to conduct surface coal mining and reclamation operations on prime farmland historically used for cropland. This section does not apply to:

- (1) Lands on which surface coal mining and reclamation operations are conducted pursuant to any permit issued prior to August 3, 1977; or
- (2) Lands on which surface coal mining and reclamation operations are conducted pursuant to any renewal or revision of a permit issued prior to August 3, 1977; or
- (3) Lands included in any existing surface coal mining operations for which a permit was issued for all or any part thereof prior to August 3, 1977, provided that: such lands are part of a single continuous surface coal mining

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operation begun under a permit issued before August 3, 1977; and the permittee had a legal right to mine the lands prior to August 3, 1977, through ownership, contract, or lease but not including an option to buy, lease, or contract; and the lands contain part of a continuous recoverable coal seam that was being mined in a single continuous mining pit (or multiple pits if the lands are proven to be part of a single continuous surface coal mining operation) begun under a permit issued prior to August 3, 1977.

For purposes of this section, renewal of a permit means a decision by the Division to extend the time by which the permittee may complete mining within the boundaries of the original permit, and revision of the permit means a decision by the Division to allow changes in the method of mining operations within the original permit area, or the decision of the Division to allow incidental boundary changes to the original permit. A pit shall be deemed to be a single continuous mining pit even if portions of the pit are crossed by a road, pipeline, railroad, or power line or similar crossing. A single continuous surface coal mining operation is presumed to consist only of a single continuous mining pit under a permit issued prior to August 3, 1977, but may include non-contiguous parcels if the operator can prove by clear and convincing evidence that, prior to August 3, 1977, the non-contiguous parcels were part of a single permitted operation. For the purposes of this paragraph, clear and convincing evidence includes, but is not limited to, contracts, leases, deeds or other properly executed legal documents (not including options) that specifically treat physically separate parcels as one surface coal mining operation.

All permit applications, whether or not prime farmland is present, shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists. The Division in consultation with the U.S. Soil Conservation Service shall determine the nature and extent of the required reconnaissance inspection.

If the reconnaissance inspection establishes that no land within the proposed permit area is prime farmland historically used for cropland, the applicant shall submit a statement that no prime farmland is present. The statement shall identify the basis upon which such a conclusion was reached.

If the reconnaissance inspection indicates that land within the proposed permit area may be prime farmland historically used for croplands, the applicant shall determine if a soil survey exists for those lands and whether soil mapping units in the permit area have been designated as prime farmland. If no soil survey exists, the applicant shall have a soil survey made of the lands within the permit area which the reconnaissance inspection indicates could be prime farmland. Soil surveys of the detail used by the U.S. Soil Conservation Service for operational conservation planning shall be used to identify and locate prime farmland soils.

If the soil survey indicates that no prime farmland soils are present within the proposed permit area, the plan shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists.

Analysis:

No additional surface facilities disturbance is associated with the current proposal of adding Federal Lease UTU-78562 to the permit area. No modification to the current MRP is required.

Findings:

Information in the application is adequate to meet the Prime Farmland Information requirements of the regulations.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Minimum Regulatory Requirements:

Each application shall include geologic information in sufficient detail to assist in: determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary; determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined; determining whether reclamation can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and, preparing the subsidence control plan.

Geologic information shall include, at a minimum, a description of the geology of the proposed permit and adjacent areas down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. This description shall include the areal and structural geology of the permit and adjacent areas, and other parameters which influence the required reclamation and it shall also show how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. It shall be based on maps and plans required as resource information for the plan, detailed site specific information as required below, and, geologic literature and practices.

For any portion of a permit area in which the strata down to the coal seam to be mined will be removed or are already exposed, samples shall be collected and analyzed from test borings; drill cores; or fresh, unweathered, uncontaminated samples from rock outcrops down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The analyses shall result in the following:

- (1) Logs showing the lithologic characteristics including physical properties and thickness of each stratum and location of ground water where occurring;
- (2) Chemical analyses identifying those strata that may contain acid- or toxic-forming, or alkalinity-producing materials and to determine their content, except that the Division may find that the analysis for alkalinity-producing material is unnecessary; and
- (3) Chemical analysis of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the Division may find that the analysis of pyritic sulfur content is unnecessary.

For lands within the permit and adjacent areas where the strata above the coal seam to be mined will not be removed, samples shall be collected and analyzed from test borings or drill cores to provide the following data:

- (1) Logs of drill holes showing the lithologic characteristics, including physical properties and thickness of each stratum that may be impacted, and location of ground water where occurring;
- (2) Chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined;
- (3) Chemical analyses of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the Division may find that the analysis of pyrite sulfur content is unnecessary; and
- (4) For standard room-and-pillar mining operations, the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined.

If determined to be necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards, the Division may require the collection, analysis, and description of additional geologic information.

An applicant may request the Division to waive in whole or in part the requirements of the borehole information or analysis required of this section. The waiver may be granted only if the Division finds in writing that the collection and analysis of such data are unnecessary because other information having equal value or effect is available to the Division in a satisfactory form.

Analysis:

The geologic coverage of the area is already sufficiently addressed in the current MRP. Maps 6-1, 6-2, and 6-3 (Regional Geology, Coal Seam Structure, and Lower Sunnyside Coal

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seam, respectively) were resubmitted to illustrate the addition of Federal Lease UTU-78562. No additional changes were made to the above-referenced maps.

Findings:

Information that was resubmitted in the application is adequate to meet the requirements of the Geologic Resource Information section of the regulations.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 701.5, 784.14; R645-100-200, -301-724.

Minimum Regulatory Requirements:

Sampling and Analysis.

All water-quality analyses performed to meet the requirements of this section shall be conducted according to the methodology in the 15th edition of "Standard Methods for the Examination of Water and Wastewater," which is incorporated by reference, or the methodology in 40 CFR Parts 136 and 434. Water-quality sampling shall be conducted according to either methodology listed above when feasible. This incorporation by reference was approved by the Director of the Federal Register on October 26, 1983. This document is incorporated as it exists on the date of the approval, and a notice of any change in it will be published in the Federal Register.

Baseline information.

The application shall include the following baseline hydrologic information, and any additional information required by the Division.

- (1) Ground-water information. The location and ownership for the permit and adjacent areas of existing wells, springs, and other ground-water resources, seasonal quality and quantity of ground water, and usage. Water-quality descriptions shall include, at a minimum, total dissolved solids or specific conductance corrected to 25 °C, pH, total iron, and total manganese. Ground-water quantity descriptions shall include, at a minimum, approximate rates of discharge or usage and depth to the water in the coal seam, and each water-bearing stratum above and potentially impacted stratum below the coal seam.
- (2) Surface-water information. The name, location, ownership, and description of all surface-water bodies such as streams, lakes, and impoundments, the location of any discharge into any surface-water body in the proposed permit and adjacent areas, and information on surface-water quality and quantity sufficient to demonstrate seasonal variation and water usage. Water-quality descriptions shall include, at a minimum, baseline information on total suspended solids, total dissolved solids or specific conductance corrected to 25 °C, pH, total iron, and total manganese. Baseline acidity and alkalinity information shall be provided if there is a potential for acid drainage from the proposed mining operation. Water-quantity descriptions shall include, at a minimum, baseline information on seasonal flow rates.
- (3) Supplemental information. If the determination of the probable hydrologic consequences (PHC) indicates that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies, then supplemental information shall be provided to evaluate such probable hydrologic consequences and to plan remedial and reclamation activities. Such supplemental information may be based upon drilling, aquifer tests, hydrogeologic analysis of the water-bearing strata, flood flows, or analysis of other water-quality or quantity characteristics.

Baseline cumulative impact area information.

- (1) Hydrologic and geologic information for the cumulative impact area necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and ground-water systems shall be provided if available from appropriate Federal or State agencies.
- (2) If this information is not available from such agencies, then the applicant may gather and submit this information as part of the permit application.
- (3) The permit shall not be approved until the necessary hydrologic and geologic information is available.

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Modeling.

The use of modeling techniques, interpolation, or statistical techniques may be included as part of the permit application, but actual surface- and ground-water information may be required for each site even when such techniques are used.

Probable hydrologic consequences determination.

- 1.) The application shall contain a determination of the probable hydrologic consequences (PHC) of the proposed operation based upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.
- 2.) The PHC determination shall be based on baseline hydrologic, geologic, and other information collected for the permit application and may include data statistically representative of the site.
- 3.) The PHC determination shall include findings on: whether adverse impacts may occur to the hydrologic balance; whether acid-forming or toxic-forming materials are present that could result in the contamination of surface or ground water supplies; and, what impact the proposed operation will have on sediment yield from the disturbed area; acidity, total suspended and dissolved solids, and other important water quality parameters of local impact; flooding or streamflow alteration; ground water and surface water availability; and other characteristics as required.
- 4.) An application for a permit revision shall be reviewed by the Division to determine whether a new or updated PHC shall be required.

Ground-water monitoring plan.

- 1.) The application shall include a ground-water monitoring plan based upon the PHC determination and the analysis of all baseline hydrologic, geologic, and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the ground water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance. It shall identify the quantity and quality parameters to be monitored, sampling frequency, and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At a minimum, total dissolved solids or specific conductance corrected to 25 °C, pH, total iron, total manganese, and water levels shall be monitored and data submitted to the Division at least every 3 months for each monitoring location. The Division may require additional monitoring.
- 2.) If an applicant can demonstrate by the use of the PHC determination and other available information that a particular water-bearing stratum in the proposed permit and adjacent areas is not one which serves as an aquifer which significantly ensures the hydrologic balance within the cumulative impact area, then monitoring of that stratum may be waived by the Division.

Surface-water monitoring plan.

- 1.) The application shall include a surface-water monitoring plan based upon the PHC determination and the analysis of all baseline hydrologic, geologic, and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance, as well as the effluent limitations found at 40 CFR Part 434.
- 2.) The plan shall identify the surface-water quantity and quality parameters to be monitored, sampling frequency, and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At all monitoring locations in streams, lakes, and impoundments that are potentially impacted or into which water will be discharged and at upstream monitoring locations, the total dissolved solids or specific conductance corrected to 25 °C, total suspended solids, pH, total iron, total manganese, and flow shall be monitored. For point-source discharges, monitoring shall be conducted in accordance with 40 CFR Parts 122, 123, and 434 and as required by the National Pollutant Discharge Elimination System permitting authority.
- 3.) The monitoring reports shall be submitted to the Division every 3 months. The Division may require additional monitoring.

Analysis:**Sampling and Analysis**

The sampling and analysis as outlined in the current plan is adequate for the current proposal.

Baseline Information

Adequate baseline information has been submitted to characterize the Whitmore Canyon drainage basin. Streams ST-3 and ST-8 have been sampled on a quarterly basis since May 1997. Springs SP-12, SP-13, SP-16 have been sampled on a quarterly basis since May 1997 to characterize the impacts to Colton and North Horn formations in Whitmore Canyon, respectively. Springs WR-1 and WR-2 have been sampled on a quarterly basis since June 1999 to characterize impacts to the Colton Formation on West Ridge. The addition of Stream sites ST-9 and ST-10 and Spring S-80 will be initiated in Grassy Trail Creek and Hanging Rock Spring to further characterize the potential impacts to the area.

Ground-Water Information

Groundwater is currently being monitored in the Blackhawk Formation at DH 86-2 and previously at DH 86-1. The adjacent Sunnyside mine was making appreciable water in the area of Whitmore Canyon. The proposed lease is down-dip of DH 86-2 and along strike of the Sunnyside mine workings, which illustrates a potential for appreciable groundwater to exist. Unfortunately, none of the exploration drill holes documented whether groundwater was encountered, so an important source of information is not available. If appreciable water is encountered, it will be handled in a fashion similar to water encountered at the Sunnyside Mines. Water at the Sunnyside Mine was used in the mine, or placed in the Sedimentation Pond prior to discharge. Discharge would be into the ephemeral C Canyon drainage, which is approximately 10 miles from the confluence with Grassy Trail Creek, the first perennial stream.

Surface-Water Information

The surface water information as outlined in the current plan (Mayo and Associates, 1997, appendix 7-1) is adequate for the current proposal.

Baseline Cumulative Impact Area Information

The information provided in the Mayo and Associate reports (1998, 2001 respectively) adequately characterize the area, with the exception of possibly better characterizing a groundwater elevation, which has been addressed in the Coal Resource and Geologic Information Maps section of this Technical Analysis.

Modeling

No numerical models have been created for the area.

Alternative Water Source Information

The determination, by the applicant, of the probable hydrologic consequences indicates that the proposed coal mining activities will not result in the contamination, diminution, or interruption of groundwater or surface-water sources within the proposed or adjacent areas. Any water that will be produced/discharged from the mine will potentially have beneficial use to wildlife and irrigation of agricultural fields; similar uses were developed at the Sunnyside Mine when water was discharging from that mine.

Probable Hydrologic Consequences Determination

The analysis of the probable hydrologic consequences (PHC), conducted by the permittee, concluded that it is highly unlikely mining will result in the permanent decrease of surface or groundwater discharge rates in the area surrounding Grassy Trail Creek. The stream channel is underlain by approximately 2,000 feet of cover, which includes the entire thickness of the North Horn Formation. The North Horn Formation is known to form an aquaclude, an effective barrier to vertical groundwater migration. The combination of extensive cover and the malleable nature of the North Horn Formation, inhibit any detrimental affects to the surface water flows and groundwater flows emanating from the Colton or North Horn Formations due to subsidence. Any differential subsidence of the channel should only have a temporary localized effect on sediment yield due to the nature of steep mountain streams flowing on alluvial or soft bedrock sediments.

Impacts to important water quality parameters should be minimal. Any water discharged from the mine will flow into the ephemeral C Canyon drainage, which is approximately 10 miles from the confluence of Grassy Trail Creek, the first perennial stream. It is unlikely any flow from the mine will enter Grassy Trail Creek based on the general aridity of the region and the permeable nature of the alluvial sediments. Based on water quality from the neighboring Sunnyside Mines, the chemistry of the water is anticipated to be similar to waters that have been in contact with the Mancos Shale.

Findings:

Information provided in the current application is adequate to meet the requirements of the Hydrologic Resource Information section of the regulations.

ENVIRONMENTAL RESOURCE INFORMATION

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Minimum Regulatory Requirements:

The permit application must include as part of the Resource Information, the following maps, plans and cross sections:

Affected area boundary maps

The boundaries of all areas proposed to be affected over the estimated total life of the underground mining activities, with a description of size, sequence, and timing of the mining of subareas for which it is anticipated that additional permits will be sought.

Archeological site maps

Known archeological sites within the permit or adjacent areas. Note - Information on the nature and location of archeological resources on public land and Indian land as required under the Archeological Resources Protection Act of 1979 must be submitted separately from the application, and marked and held as confidential.

Coal resource and geologic information maps

Nature, depth, and thickness of the coal seams to be mined, any coal or rider seams above the seam to be mined, each stratum of the overburden, and the stratum immediately below the lowest coal seam to be mined. All coal crop lines and the strike and dip of the coal to be mined within the proposed permit area.

Cultural resource maps

The boundaries of any public park and locations of any cultural and historical resources listed or eligible for listing in the National Register of Historic Places. Each cemetery that is located in or within 100 feet of the proposed permit area. Any land within the proposed permit area which is within the boundaries of any units of the National System of Trails or the Wild and Scenic Rivers System, including study rivers designated under Section 5(a) of the Wild and Scenic Rivers Act. Any other relevant information required by the Division.

Existing structures and facilities maps

Location and dimensions of existing areas of spoil, waste, coal development waste, and noncoal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities within the proposed permit area.

Existing surface configuration maps

Sufficient slope measurements to adequately represent the existing land surface configuration of the area affected by surface operations and facilities, measured and recorded according to the following: each measurement shall consist of an angle of inclination along the prevailing slope extending 100 linear feet above and below or beyond the coal outcrop or the area to be disturbed or, where this is impractical, at locations specified by the Division; where the area has been previously mined, the measurements shall extend at least 100 feet beyond the limits of mining disturbances, or any other distance determined by the Division to be representative of the premining configuration of the land; and, slope measurements shall take into account natural variations in slope, to provide accurate representation of the range of natural slopes and reflect geomorphic differences of the area to be disturbed.

Mine workings maps

Location and extent of known workings of active, inactive, or abandoned underground mines, including mine openings to the surface within the proposed permit and adjacent areas. Location and extent of existing or previously surface-mined areas within the proposed permit area.

Monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, fish and wildlife, and air quality, if required, in preparation of the application

Permit area boundary maps

The boundaries of land within the proposed permit area upon which the applicant has the legal right to enter and begin underground mining activities.

Subsurface water resource maps

Location and extent of subsurface water, if encountered, within the proposed permit or adjacent areas, including, but not limited to, areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross sections and contour maps.

Surface and subsurface manmade features maps

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current use of the buildings. The location of surface and subsurface manmade features within, passing through, or passing over the proposed permit area, including, but not limited to, major electric transmission lines, pipelines, and agricultural drainage tile fields. Each public road located in or within 100 feet of the proposed permit area.

Surface and subsurface ownership maps

All boundaries of lands and names of present owners of record of those lands, both surface and subsurface, included in or contiguous to the permit area.

Surface water resource maps

The locations of water-supply intakes for current users of surface waters flowing into, out of, and within a hydrologic area defined by the Division, and those surface waters which will receive discharges from affected areas in the proposed permit area. Location of surface water bodies such as streams, lakes, ponds, springs, constructed or natural drains, and irrigation ditches within the proposed permit and adjacent areas.

Vegetation reference area maps

The location and boundaries of any proposed reference areas for determining the success of revegetation.

Well maps

Location, and depth if available, of gas and oil wells within the proposed permit area and water wells in the permit area and adjacent areas.

Cross sections, maps, and plans included in a permit application as required by this section shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional, land surveyor, with assistance from experts in related fields such as landscape architecture, and shall be updated periodically as required by the Division.

Analysis:

Affected Area Boundary Maps

The Permittee gave the Division several maps that show the permit boundaries for the West Ridge mine including the Map 1-1 Location Map. Map 5-4A, Mining Projections shows the currently proposed mine layout. Because the Permittee is planning to acquire additional leases, Map 5-4B Mining Projections (Extended Reserves) illustrates the anticipated mine plan. Future mine plans (Extended Reserves) will be based on the acquiring additional leases.

Archeological Site Maps

Map 4-2, Archeology Map, has been updated with this submittal. It shows the locations of archaeological surveys that have been done in the area and of cultural resource sites.

Coal Resource and Geologic Information Maps

The combination of Maps 5-7 (Subsidence) and 6-2 (Coal Seam Structure) adequately illustrate the nature, depth, and thickness of the coal seams to be mined. Map 6-1A (Geologic Cross-Section) illustrates a generalized identification of the stratum above and below the coal seam to be mined (Lower Sunnyside).

Both within the Geologic and Hydrologic sections (the stratigraphy and subsurface resource maps) groundwater systems have not been mapped due to the 'limited areal and vertical extent of the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata'.

Updated in the February 2, 2002 submittal, and supporting the heterogeneous/discontinuous nature of the geology, Appendix 6-2 has been added to the application. Appendix 6-2 is a fence diagram of the geologic units found in exploration holes N-17, B-8, B-7, H-16, H-31, and H-17 which are located generally along strike and parallel Grassy Trail Creek through the proposed permit extension. The fence diagram illustrates that no continuous geologic unit overlies the Lower Sunnyside coal seam in the 35-40 feet directly above the coal seam. With the exception of Hole B-7, the Lower Sunnyside coal seam is overlain by 15 to 35 feet of shale and discontinuous coal. The fence diagram used only the portions of the drill holes that were core-drilled.

Contour Maps

Several maps show the existing contour at or near the Whitmore lease, such as Map 1-1. That map is at a scale of 1-inch equals 2000 feet and has a contour interval of 40 feet.

Cultural Resource Maps

Map 4-2, Archeology Map, has been updated with this submittal. It shows the locations of archaeological surveys that have been done in the area and of cultural resource sites.

Existing Structures and Facilities Maps

No surface or subsurface features, such as buildings, transmission lines, pipelines exist in or near the proposed permit area. The Carbon County Road RS2477 that provided access to the top of West Ridge is located with the Whitmore lease. Several other dirt roads are located in the

permit area, including a road in the Left Fork of Whitmore Canyon.

Updated in the February 2, 2002 submittal, Map 1-1 (Location Map) shows that part of the Grassy Trails reservoir is located within the permit area. The application states that less than 0.6-acres of Grassy Trail Reservoir lies within a corner of the permit area in Section 521.120. The MRP indicates in text that part of the Grassy Trail Reservoir is located within the permit area, as of the February 2, 2002 submittal.

Existing Surface Configuration Maps

Several maps show the existing surface configuration of the Whitmore lease, such as Map 1-1. That map is at a scale of 1-inch equals 2000 feet and has a contour interval of 40 feet.

Mine Workings Maps

The existing and proposed mine workings for the West Ridge mine and the Sunnyside mine are shown on Map 5-4A, Mining Projections. The map shows the location of the abandoned workings in the Sunnyside mine. The existing mine working and the proposed mine workings up to 2011 are shown.

Permit Area Boundary Maps

The Permittee gave the Division several maps that show the permit boundaries for the West Ridge mine including the Map 1-1 Location Map. Map 5-4A, Mining Projections shows the outline of the proposed permit boundary changes.

Surface and Subsurface Ownership Maps

The surface and subsurface ownership maps are shown on Map 5-2 and Map 5-3 respectively.

Surface and subsurface manmade features maps

A road exists in the Left Fork of Whitmore Canyon and a small part of the Grassy Trail Reservoir is located in the eastern part of the Whitmore lease. No subsurface manmade features exist in the Whitmore lease area.

Subsurface Water Resource Maps

The data available indicate no 'economic' water resources exist. The applicant has provided additional geologic information to support this finding (See Coal Resource and Geologic Information Maps).

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Vegetation Reference Area Maps

The current mining and reclamation plan contains a map showing the vegetation reference areas. Vegetation communities of the current and proposed revised permit area are shown on Map 3-1.

Findings:

Information provided in the proposal is adequate to meet all the requirements of the Maps, Plans, and Cross Sections of Resource Information section of the regulations.

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OPERATION PLAN

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Minimum Regulatory Requirements:

The objectives of this section is to ensure that the Division is provided with comprehensive and reliable information on proposed underground mining activities, and to ensure that those activities are allowed to be conducted only in compliance with the regulatory program.

Provide a general description of the mining operations proposed to be conducted during the life of the mine within the proposed permit area, including, at a minimum, the following: a narrative description of the type and method of coal mining procedures and proposed engineering techniques, anticipated annual and total production of coal, by tonnage, and the major equipment to be used for all aspects of those operations; and, a narrative explaining the construction, modification, use, maintenance, and removal of the following facilities (unless retention of such facility is necessary for postmining land use is specified.) The following facilities must be described: dams, embankments, and other impoundments; overburden and topsoil handling and storage areas and structures; coal removal, handling, storage, cleaning, and transportation areas and structures; spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures; mine facilities; and, water pollution control facilities.

Analysis:

General

The current proposal is an extension of coal reserves to the current mine plan. The type and method of coal mining procedures and proposed engineering techniques has not changed. The anticipated annual production and major equipment to be used will remain the same. No new facilities or structures are planned or anticipated. No modification to the current MRP is necessary.

Type and Method of Mining Operations

The Permittee will continue to use longwall mining as the primary source of coal production. Continuous miners will be used for development work and to mine pockets of coal that cannot be mined with longwall methods.

Facilities and Structures

No additional surface facilities or structures will be built as a direct result of the Whitmore lease.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operation Plan – Mining Operations and Facilities section of the regulations. No changes to this section of the Mining Plan are anticipated.

EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

Minimum Regulatory Requirements:

"Existing Structure" means a structure or facility used in connection with or to facilitate coal mining and reclamation operations for which construction began prior to January 21, 1981.

Provide a description of each existing structure proposed to be used in connection with or to facilitate the surface coal mining and reclamation operation. The description shall include: the location; plans of the structure which describe its current condition; approximate dates on which construction of the existing structure was begun and completed; and, a showing, including relevant monitoring data or other evidence, whether the structure meets the permanent program performance standards or, if the structure does not meet the permanent program performance standards, a showing whether the structure meets the interim program performance standards.

Provide a compliance plan for each existing structure proposed to be modified or reconstructed for use in connection with or to facilitate the surface coal mining and reclamation operation. The compliance plan shall include: design specifications for the modification or reconstruction of the structure to meet the permanent program design and performance standards; a construction schedule which shows dates for beginning and completing interim steps and final reconstruction; provisions for monitoring the structure during and after modification or reconstruction to ensure that the permanent program performance standards are met; and, a showing that the risk of harm to the environment or to public health or safety is not significant during the period of modification or reconstruction.

Analysis:

The existing structures at the Whitmore lease include dirt roads and part of the Grassy Trail reservoir. Those structures are shown on several maps including Map 1-1, Location Map.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operation Plan – Existing Structures section of the regulations.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR 784.17; R645-301-411.

Minimum Regulatory Requirements:

For any publicly owned parks or any places listed on the National Register of Historic Places that may be adversely affected by the proposed operation, each plan shall describe the measures to be used to prevent adverse impacts, or if valid

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existing rights exist or joint agency approval is to be obtained, to minimize impacts.

The Division may require the applicant to protect historic and archeological properties listed on or eligible for listing on the National Register of Historic Places through appropriate mitigation and treatment measures. Appropriate mitigation and treatment measures may be required to be taken after permit issuance provided that the required measures are completed before the properties are affected by any mining operation.

Analysis:

No public parks or significant cultural resource sites are known to exist in the proposed addition to the permit area. Just outside the area is one site that might be eligible for listing in the National Register of Historic Places, but this site should not be affected by the mining operations.

Updated since the February 2, 2002 submittal, the State Historic Preservation Officer has concurred with the Division's finding that the proposed action will not adversely affect any cultural resource sites.

Findings:

Information provided in the application is adequate to meet the requirements of the Operation Plan – Protection of Public Parks and Historic Places section of the regulations.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Minimum Regulatory Requirements:

Describe, with appropriate maps and cross sections, the measures to be used to ensure that the interests of the public and landowners affected are protected if, the applicant seeks to have the Division approve conducting the proposed underground mining activities within 100 feet of the right-of-way line of any public road, except where mine access or haul roads join that right-of-way, or relocating a public road.

Analysis:

No additional public roads will be used or relocated in connection with the Whitmore lease.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operation Plan – Relocation or Use of Public Roads section of the regulations.

AIR POLLUTION CONTROL PLAN

OPERATION PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244.

Analysis:

The current mining and reclamation plan contains a copy of the Air Quality Approval Order. Since this order does not apply to underground operations and since the applicant has not proposed any new surface facilities, no changes in the Air Quality Approval Order should be needed.

Findings:

Information in the application is adequate to meet the Air Pollution Control Plan section of the regulations.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Minimum Regulatory Requirements:

Underground mining activities shall be conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain environmental integrity, so that re-affecting the land in the future through surface coal mining operations is minimized.

Analysis:

The Applicant submitted a resource recovery and protection plan to the BLM. The R2P2 outlined how the Applicant would maximize coal recovery. The BLM has staff members who are specifically trained in evaluating coal recovery programs. The Division relies on the expertise of the BLM in evaluating coal recovery programs.

The Division reviewed the coal recovery program and found that the mining layout and mining methods will maximize coal recovery. The Permittee will use longwall mining where feasible. Coal recovery is dependent on several factors including depth of cover and coal quality and thickness. Since those factors cannot be determined before mining the recovery plan will be adjusted as more information is obtained.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operation Plan – Coal Recovery section of the regulations.

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SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Minimum Regulatory Requirements:

Renewable resources survey

Include a survey, which shall show whether structures or renewable resource lands exist within the proposed permit area and adjacent area and whether subsidence, if it occurred, could cause material damage or diminution of reasonably foreseeable use of such structures or renewable resource lands. If the survey shows that no such structures or renewable resource lands exist, or no such material damage or diminution could be caused in the event of mine subsidence, and if the Division agrees with such conclusion, no further information need be provided in the application under this section.

Subsidence control plan

In the event the survey shows that such structures or renewable resource lands exist, and that subsidence could cause material damage or diminution of value or foreseeable use of the land, or if the Division determines that such damage or diminution could occur, the application shall include a subsidence control plan which shall contain the following information:

- 1.) A description of the method of coal removal, such as longwall mining, room-and-pillar removal, hydraulic mining, or other extraction methods, including the size, sequence, and timing for the development of underground workings.
- 2.) A map of underground workings which describes the location and extent of areas in which planned-subsidence mining methods will be used and which includes all areas where measures will be taken to prevent or minimize subsidence and subsidence related damage and where appropriate, to correct subsidence-related material damage.
- 3.) A description of the physical conditions, such as depth of cover, seam thickness, and lithology, which affect the likelihood or extent of subsidence and subsidence-related damage.
- 4.) A description of monitoring, if any, needed to determine the commencement and degree of subsidence so that, when appropriate, other measures can be taken to prevent, reduce, or correct material damage.
- 5.) Except for those areas where planned subsidence is projected to be used, a detailed description of the subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage, including, but not limited to: backstowing or backfilling of voids; leaving support pillars of coal; leaving areas in which no coal is removed, including a description of the overlying area to be protected by leaving the coal in place; and, taking measures on the surface to prevent material damage or lessening of the value or reasonably foreseeable use of the surface.
- 6.) A description of the anticipated effects of planned subsidence, if any.
- 7.) A description of the measures to be taken to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land, or structures or facilities to the extent required under State law.
- 8.) Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with the performance standards for subsidence control.

Performance standards for subsidence control

The operator shall either adopt measures consistent with known technology which prevent subsidence from causing material damage to the extent technologically and economically feasible, maximize mine stability, and maintain the value and reasonably foreseeable use of surface lands; or, adopt mining technology which provides for planned subsidence in a predictable and controlled manner. Nothing in this part shall be construed to prohibit the standard method of room-and-pillar mining.

The operator shall comply with all provisions of the approved subsidence control plan.

The operator shall correct any material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence, and, to the extent required under applicable provisions of State law, either correct material damage resulting from subsidence caused to any structures or facilities by repairing the damage or compensate the owner of such structures or facilities in the full amount of the diminution in value resulting from the subsidence. Repair of damage includes rehabilitation, restoration, or replacement of damaged structures or facilities. Compensation may be accomplished by the purchase prior to mining of a non-cancelable premium-prepaid insurance policy.

Underground mining activities shall not be conducted beneath or adjacent to: public buildings and facilities; churches, schools, and hospitals; or, impoundments with a storage capacity of 20 acre-feet or more or bodies of water with a volume of 20 acre-feet or more, unless the subsidence control plan demonstrates that subsidence will not cause material damage to, or reduce the reasonably foreseeable use of, such features or facilities. If the Division determines that it is necessary in order to minimize the

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potential for material damage to the features or facilities described above or to any aquifer or body of water that serves as a significant water source for any public water supply system, it may limit the percentage of coal extracted under or adjacent thereto.

If subsidence causes material damage to any of the features or facilities, the Division may suspend mining under or adjacent to such features or facilities until the subsidence control plan is modified to ensure prevention of further material damage to such features or facilities.

The Division shall suspend underground mining activities under urbanized areas, cities, towns, and communities, and adjacent to industrial or commercial buildings, major impoundments, or perennial streams, if imminent danger is found to inhabitants of the urbanized areas, cities, towns, or communities.

Within a schedule approved by the Division, the operator shall submit a detailed plan of the underground workings. The detailed plan shall include maps and descriptions, as appropriate, of significant features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measures taken to prevent or minimize subsidence and related damage, areas of full extraction, and other information required by the Division. Upon request of the operator, information submitted with the detailed plan may be held as confidential.

Notification

At least 6 months prior to mining, or within that period if approved by the Division, the underground mine operator shall mail a notification to all owners and occupants of surface property and structures above the underground workings. The notification shall include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

Analysis:

Renewable Resources Survey

Updated in the February 2, 2002 submittal, the application contains a pre-subsidence survey of the Whitmore lease area. The results of the survey are noted in Appendix 5-8 and in the subsidence section of the MRP. A small portion of the Grassy Trail dam and reservoir are located in the permit area. The Permittee plans to protect those structures from subsidence. Other structures in the Whitmore tract area include dirt roads.

Subsidence Control Plan

Updated in the February 2, 2002 submittal, in Section 525.200(Subsidence Control Plan of MRP), the application states that as longwall mining approaches Grassy Trail Reservoir ongoing subsidence monitoring information will be used to determine the angle of draw and the subsidence ratio in the area. The applicant acknowledges Grassy Trail Reservoir impounds more than 20 acre-feet of water on Page 23. Based on this information, the underground workings will be designed to ensure that the reservoir is not adversely affected by mining activities.

Before the completion of Panel 5 in the year 2005, the Permittee will hire a professional rock mechanics engineering company (such as Agapito and Associates) to prepare a detailed analysis of the subsidence characteristics of the West Ridge Mine. The information will be used to develop a mine plan that will prevent subsidence in the Grassy Trail reservoir area.

Also updated in the February 2, 2002 submittal, Map 5-7 (Subsidence Map), shows where subsidence will occur. The map shows that subsidence and mining not will take place outside the permit boundary.

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Map 5-4A and Map 5-4B show the location of each longwall panel and the estimated dates when mining will occur. Those maps can be overlaid on Map 5-7 so that the approximate dates of subsidence can be determined.

Performance Standards for Subsidence Control

The Permittee commits to meet the performance standards of subsidence control. Performance standards are specified in the Utah coal rules and Division inspectors will monitor compliance.

Notification

The Permittee is required to meet the notification standards. Since the exact dates when mining will occur for each ownership section are unknown, the Permittee will be responsible to notify each landowner at least 6 month before mining activities.

Findings:

Information updated in the February 2, 2002 submittal is adequate to meet the requirements of the Operation Plan – Subsidence Control Plan section.

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR 817.99; R645-301-515.

Minimum Regulatory Requirements:

At any time a slide occurs which may have a potential adverse effect on public, property, health, safety, or the environment, the person who conducts the underground mining activities shall notify the Division by the fastest available means and comply with any remedial measures required by the Division.

The permit application will incorporate a description of notification when potential impoundment hazards exist. The requirements for the description are: If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment will promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division will be notified immediately. The Division will then notify the appropriate agencies that other emergency procedures are required to protect the public.

Analysis:

West Ridge Resources has made a written commitment to notify the Division by telephone and comply with required remedial measures in the current MRP. No modification is necessary.

Findings:

Information provided in the proposal is adequate to meet the requirements of Operational Plan – Slides and Other Damage section of the regulations.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Minimum Regulatory Requirements:

Protection and enhancement plan

Each application shall include a description of how, to the extent possible using the best technology currently available, the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during the surface coal mining and reclamation operations and how enhancement of these resources will be achieved where practicable. This description shall apply, at a minimum, to species and habitats identified. The description shall include: protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, and the monitoring of surface water quality and quantity; and, enhancement measures that will be used during the reclamation and postmining phase of operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of vegetation for wildlife food and cover, and the placement of perches and nest boxes. Where the plan does not include enhancement measures, a statement shall be given explaining why enhancement is not practicable.

Each operator shall, to the extent possible using the best technology currently available: ensure that electric powerlines and other transmission facilities used for, or incidental to, underground mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Division determines that such requirements are unnecessary; locate and operate haul and access roads so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law; design fences, overland conveyors, and other potential barriers to permit passage for large mammals except where the Division determines that such requirements are unnecessary; and, fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

Endangered and threatened species

No underground mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary or which is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The operator shall promptly report to the Division any State- or federally-listed endangered or threatened species within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with appropriate State and Federal fish and wildlife agencies and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

Bald and golden eagles

No underground mining activity shall be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs. The operator shall promptly report to the Division any golden or bald eagle nest within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with the U.S. Fish and Wildlife Service and also, where appropriate, the State fish and wildlife agency and, after consultation, shall identify whether, and under

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what conditions, the operator may proceed.

Nothing in these regulatory requirements shall authorize the taking of an endangered or threatened species or a bald or golden eagle, its nest, or any of its eggs in violation of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

Wetlands and habitats of unusually high value for fish and wildlife

The operator conducting underground mining activities shall avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Underground mining activities shall avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Analysis:

Protection and Enhancement Plan

The protection and enhancement plan in the current plan is considered adequate for the proposed mining operations. The mining proposed in this application is similar to the operations approved in the mining and reclamation plan.

Endangered and Threatened Species

Updated in the February 2, 2002 submittal, mining in the Whitmore Canyon area should have no effect on the threatened and endangered fish species of the upper Colorado River drainage. Water consumption in this area is considered to potentially adversely affect these fish species. The mine is currently using about 67 acre-feet of water annually. The applicant has not proposed to add new mining equipment that would increase water use, and in a telephone conversation on January 9, 2002, the applicant's representative, Dave Shaver, said mining in the Whitmore Canyon Tract will not increase water consumption. He said, in fact, that the mine has implemented water conservation measures that should decrease the amount of water being used below the consumption level currently approved.

Updated since the February 2, 2002 submittal, the proposed permit area extension contains limited restricted habitat for the Mexican spotted owl, including potential foraging habitat and marginal nesting and roosting habitat. The Division has determined that issuance of the coal lease tract may affect but is not likely to affect the Mexican spotted owl and that it is not likely to adversely affect or modify or destroy critical habitat, and the Fish and Wildlife concurred with this determination. The permit includes a stipulation that adequate monitoring must be done in certain parts of the proposed permit area before mining affects these areas, and if any owls are found that might be affected by mining, the Division will need to further consult with the Fish and Wildlife Service.

Other species that may occur in the area will not be affected by this proposal for reasons discussed in the "Fish and Wildlife Resource Information" section of this analysis.

Bald and Golden Eagles

Updated in the February 2, 2002 submittal, a 1999 raptor survey indicated one red-tailed hawk nest and one great horned owl nest were found in the proposed addition to the permit area. As mining progresses, the applicant has committed to survey areas that will be mined within the next year and to consult with the Division, the Division of Wildlife Resources, and the Fish and Wildlife Service if nests are found. The applicant is required by performance standards to protect nests. These commitments meet minimum regulatory requirements.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

Although the proposed addition to the permit area contains habitat of unusually high value for mule deer, the proposed mining should have little or no effect on this habitat because there will be no surface effects other than possible subsidence. Therefore, a protection and enhancement plan is not needed.

Springs and streams in the area are considered very valuable for wildlife species, and the applicant is monitoring these water sources.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operation Plan – Fish and Wildlife section of the regulations. The Division concludes that there will be no additional effects on the humpback chub, the razorback sucker, the Colorado pikeminnow, and the bonytail. The Division also finds that mining the Whitmore Tract may affect but is not likely to affect the Mexican spotted owl and that it is not likely to adversely affect or modify or destroy critical habitat. There should be no effects on any other listed or candidate species. The Fish and Wildlife Service has concurred with these assessments.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR 817.22; R645-301-230.

Minimum Regulatory Requirements:

Topsoil removal and storage

All topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. Where the topsoil is of insufficient quantity or of poor quality for sustaining vegetation, the selected overburden materials approved by the Division for use as a substitute or supplement to topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. If topsoil is less than 6 inches thick, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil.

The Division may choose not to require the removal of topsoil for minor disturbances which occur at the site of small structures, such as power poles, signs, or fence lines; or, will not destroy the existing vegetation and will not cause erosion.

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All materials shall be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.

Selected overburden materials may be substituted for, or used as a supplement to, topsoil if the operator demonstrates to the Division that the resulting soil medium is equal to, or more suitable for sustaining vegetation than, the existing topsoil, and the resulting soil medium is the best available in the permit area to support revegetation.

Materials removed shall be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas. Stockpiled materials shall: be selectively placed on a stable site within the permit area; be protected from contaminants and unnecessary compaction that would interfere with revegetation; be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the Division; and, not be moved until required for redistribution unless approved by the Division.

Where long-term surface disturbances will result from facilities such as support facilities and preparation plants and where stockpiling of materials would be detrimental to the quality or quantity of those materials, the Division may approve the temporary distribution of the soil materials so removed to an approved site within the permit area to enhance the current use of that site until needed for later reclamation, provided that: such action will not permanently diminish the capability of the topsoil of the host site; and, the material will be retained in a condition more suitable for redistribution than if stockpiled.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the above requirements if it finds that such subsoil layers are necessary to comply with the revegetation.

Analysis:

No modification to the currently approved MRP is necessary. No additional Soil removal or storage is needed with the proposed addition of Federal Lease UTU-78562.

Findings:

Information in the application is adequate to meet the Topsoil and Subsoil section of the regulations.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Minimum Regulatory Requirements:

Each application will contain a plan for protection of vegetation, fish, and wildlife resources throughout the life of the mine. The plan will provide a description of the measures taken to disturb the smallest practicable area at any one time and through prompt establishment and maintenance of vegetation for interim stabilization of disturbed areas to minimize surface erosion. This may include part or all of the plan for final revegetation as described in reclamation plan for revegetation.

For UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES a description of the anticipated impacts of subsidence on renewable resource lands and how such impact will be mitigated needs to be presented.

A description of how, to the extent possible, using the best technology currently available, the operator will minimize disturbances and adverse impacts. This description will include protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, the monitoring of surface water quality and quantity, and through prompt establishment and maintenance of vegetation for interim stabilization of disturbed areas to minimize surface erosion.

Analysis:

The current mining and reclamation plan contains commitments to monitor the effects of subsidence on vegetation, which is considered adequate for the area proposed to be added to the permit area. The plan also contains a plan for establishment of interim vegetation cover in operational areas.

Findings:

Information in the application is adequate to meet the requirements of the Operational Plan - Vegetation section of the regulations.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Minimum Regulatory Requirements:

Road classification system

Each road shall be classified as either a primary road or an ancillary road. A primary road is any road which is: used for transporting coal or spoil; frequently used for access or other purposes for a period in excess of six months; or, to be retained for an approved postmining land use. An ancillary road is any road not classified as a primary road.

Plans and drawings

Each applicant for an underground coal mining and reclamation permit shall submit plans and drawings for each road to be constructed, used, or maintained within the proposed permit area. To ensure environmental protection appropriate for their planned duration and use, including consideration of the type and size of equipment used, the design and construction or reconstruction of roads shall incorporate appropriate limits for grade, width, surface materials, surface drainage control, culvert placement, and culvert size, in accordance with current, prudent engineering practices, and any necessary design criteria established by the Division. The plans and drawings shall:

- 1.) Include a map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures;
- 2.) Contain the drawings and specifications of each proposed road that is located in the channel of an intermittent or perennial stream, as necessary for approval of the road by the Division;
- 3.) Contain the drawings and specifications for each proposed ford of perennial or intermittent streams that is used as a temporary route, as necessary for approval of the ford by the Division;
- 4.) Contain a description of measures to be taken to obtain approval of the Division for alteration or relocation of a natural stream channel;
- 5.) Contain the drawings and specifications for each low-water crossing of perennial or intermittent stream channels so that the Division can maximize the protection of the stream; and,
- 6.) Describe the plans to remove and reclaim each road that would not be retained under an approved postmining land use, and the schedule for this removal and reclamation.

Performance standards

All roads shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

- 1.) Control or prevent erosion, siltation, and the air pollution attendant to erosion, including road dust and dust occurring on other exposed surfaces, by measures such as vegetating, watering, using chemical or other dust suppressants, or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices;
- 2.) Control or prevent damage to fish, wildlife, or other habitat and related environmental values;

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- 3.) Control or prevent additional contributions of suspended solids to streamflow or runoff outside the permit area;
- 4.) Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standard applicable to receiving waters;
- 5.) Refrain from seriously altering the normal flow of water in streambeds or drainage channels;
- 6.) Not locate any road in the channel of an intermittent or perennial stream unless specifically approved by the Division. Roads shall be located to minimize downstream sedimentation and flooding;
- 7.) Prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers, and National Recreation Areas designated by Act of Congress;
- 8.) Use nonacid- and nontoxic-forming substances in road surfacing; and,
- 9.) Maintain all roads to meet the performance standards of this part and any additional criteria specified by the Division. A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.

In addition to the above, primary roads shall meet the following requirements:

- 1.) The construction or reconstruction of primary roads shall be certified in a report to the Division by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the construction or reconstruction of primary roads, a qualified registered professional land surveyor, with experience in the design and construction of roads. The report shall indicate that the primary road has been constructed or reconstructed as designed and in accordance with the approved plan;
- 2.) Each primary road embankment shall have a minimum static factor of 1.3. The Division may establish engineering design standards for primary roads through the State program approval process, in lieu of engineering tests, to establish compliance with the minimum static safety factor of 1.3 for all embankments;
- 3.) Primary roads shall be located to minimize erosion, insofar as is practicable, on the most stable available surface;
- 4.) Fords of perennial or intermittent streams by primary roads are prohibited unless they are specifically approved by the Division as temporary routes during periods of road construction.
- 5.) Each primary road shall be constructed or reconstructed, and maintained to have adequate drainage control, using structures such as, but not limited to bridges, ditches, cross drains, and ditch relief drains. The drainage control system shall be designed to safely pass the peak runoff from a 10-year, 6-hour precipitation event, or greater event as specified by the Division. Drainage pipes and culverts shall be installed as designed, and maintained in a free and operating condition and to prevent or control erosion at inlets and outlets. Drainage ditches shall be constructed and maintained to prevent uncontrolled drainage over the road surface and embankment. Culverts shall be installed and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road. Natural stream channels shall not be altered or relocated without the prior approval of the Division. Except as specifically approved by the Division, structures for perennial or intermittent stream channel crossings shall be made using bridges, culverts, low-water crossings, or other structures designed, constructed, and maintained using current, prudent engineering practices. The Division shall ensure that low-water crossings are designed, constructed, and maintained to prevent erosion of the structure or streambed and additional contributions of suspended solids to streamflow.
- 6.) Primary roads shall be surfaced with material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road.

Primary road certification

The plans and drawings for each primary road shall be prepared by, or under the direction of, and certified by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the design of primary roads a qualified registered professional land surveyor, experienced in the design and construction of roads, as meeting the requirements of this chapter; current, prudent engineering practices; and any design criteria established by the Division.

Other Transportation Facilities

The plan must include a detailed description of each road, conveyor, and rail system to be constructed, used, or maintained within the proposed permit area. The description will include a map, appropriate cross sections, and the following: specifications for each road width, road gradient, road surface, road cut, fill embankment, culvert, bridge, drainage ditch, and drainage structure; measures to be taken to obtain Division approval for alteration or relocation of a natural drainageway; a maintenance plan describing how roads will be maintained throughout their life to meet the design standards throughout their use; a commitment that if a road is damaged by a catastrophic event, such as a flood or earthquake, the road will be repaired as soon as practical after the damage has occurred; a report of appropriate geotechnical analysis, where approval of the Division is required for alternative specifications, or for steep cut slopes.

Analysis:

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No modification to the current MRP is necessary because no additional roads will be built or modified as a result of the Whitmore Lease. Due to no additional roads being built, the Road classification system, Plans and drawings, Performance standards, Primary road certification, and other transportation facilities remain the same as stated in the current MRP.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operational Plan – Road Systems and Other Transportation Facilities section of the regulations.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Minimum Regulatory Requirements:

Disposal of noncoal mine wastes

Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities shall be placed and stored in a controlled manner in a designated portion of the permit area. Placement and storage shall ensure that leachate and surface runoff do not degrade surface or ground water, that fires are prevented, and that the area remains stable and suitable for reclamation and revegetation compatible with the natural surroundings.

Final disposal of noncoal mine wastes shall be in a designated disposal site in the permit area or a State-approved solid waste disposal area. Disposal sites in the permit area shall be designed and constructed to ensure that leachate and drainage from the noncoal mine waste area does not degrade surface or underground water. Wastes shall be routinely compacted and covered to prevent combustion and windborne waste. When the disposal is completed, a minimum of 2 feet of soil cover shall be placed over the site, slopes stabilized, and revegetated. Operation of the disposal site shall be conducted in accordance with all local, State, and Federal requirements.

At no time shall any noncoal mine waste be deposited in a refuse pile or impounding structure, nor shall any excavation for a noncoal mine waste disposal site be located within 8 feet of any coal outcrop or coal storage area.

Any noncoal mine waste defined as "hazardous" under Section 3001 of the Resource Conservation and Recovery Act (RCRA) (Pub. L. 94-580, as amended) and 40 CFR Part 261 shall be handled in accordance with the requirements of Subtitle C of RCRA and any implementing regulations.

Coal mine waste

Each plan shall contain descriptions, including appropriate maps and cross-section drawings of the proposed disposal methods and sites for placing underground development waste and excess spoil generated at surface areas affected by surface operations and facilities. Each plan shall describe the geotechnical investigation, design, construction, operation, maintenance, and removal, if appropriate, of the structures.

All coal mine waste shall be placed in new or existing disposal areas within a permit area that are approved by the Division for this purpose. Coal mine waste shall be placed in a controlled manner to:

- 1.) Minimize adverse effects of leachate and surface-water runoff on surface- and ground-water quality and quantity;
- 2.) Ensure mass stability and prevent mass movement during and after construction;
- 3.) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use;

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- 4.) Not create a public hazard; and
- 5.) Prevent combustion.

Coal mine waste materials from activities located outside a permit area may be disposed of in the permit area only if approved by the Division. Approval shall be based upon a showing that such disposal will be in accordance with the standards of this section.

The disposal facility shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Division. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, shall certify the design of the disposal facility. The disposal facility shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments must be stable under all conditions of construction. Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of the foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the disposal facility.

If any examination or inspection discloses that a potential hazard exists, the Division shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented the Division shall be notified immediately. The Division shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

Refuse piles

Refuse piles shall meet the requirements of coal mine waste, the additional requirements provided below and the requirements of 30 CFR Sections 77.214 and 77.215.

If the disposal area contains springs, natural or manmade water courses, or wet-weather seeps, the design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the disposal facility, and ensure stability. Uncontrolled surface drainage may not be diverted over the outslope of the refuse pile. Runoff from areas above the refuse pile and runoff from the surface of the refuse pile shall be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff diverted from undisturbed areas need not be commingled with runoff from the surface of the refuse pile.

Underdrains shall comply with the general requirements for the disposal of excess spoil.

Slope protection shall be provided to minimize surface erosion at the site. All disturbed areas, including diversion channels that are not riprapped or otherwise protected, shall be revegetated upon completion of construction.

All vegetative and organic materials shall be removed from the disposal area prior to placement of coal mine waste. Topsoil shall be removed, segregated and stored or redistributed. If approved by the Division, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

The final configuration of the refuse pile shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the refuse pile if required for stability, control of erosion, conservation of soil moisture, or facilitation of the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:1v (50 percent).

No permanent impoundments shall be allowed on the completed refuse pile. Small depressions may be allowed by the Division if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation, and if they are not incompatible with the stability of the refuse pile.

Following final grading of the refuse pile, the coal mine waste shall be covered with a minimum of 4 feet of the best available, nontoxic and noncombustible material, in a manner that does not impede drainage from the underdrains. The Division may allow less than 4 feet of cover material based on physical and chemical analyses which show that the revegetation requirements will be met.

A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, shall inspect the refuse pile during construction. The professional engineer or specialist shall be experienced in the construction of similar earth and waste structures. Such inspection shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include, at a minimum: Foundation preparation including the removal of all organic material and topsoil; Placement of underdrains and protective filter systems; Installation of final surface drainage systems; and, The final graded and revegetated facility. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of coal mine waste materials. More frequent inspections shall be conducted if a danger of harm exists to the public health and safety or the environment. Inspections shall continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.

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The qualified registered professional engineer shall provide a certified report to the Division promptly after each inspection that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and this Chapter. The report shall include appearances of instability, structural weakness, and other hazardous conditions. The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with coal mine waste. If the underdrain system is constructed in phases, each phase shall be certified separately. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report shall be retained at or near the minesite.

Impounding structures

New and existing impounding structures constructed of coal mine waste or intended to impound coal mine waste shall meet the requirements for coal mine waste.

Coal mine waste shall not be used for construction of impounding structures unless it has been demonstrated to the Division that the stability of such a structure conforms to the requirements of this part and that the use of coal mine waste will not have a detrimental effect on downstream water quality or the environment due to acid seepage through the impounding structure. The stability of the structure and the potential impact of acid mine seepage through the impounding structure shall be discussed in detail in the design plan submitted to the Division.

Each impounding structure constructed of coal mine waste or intended to impound coal mine waste shall be designed, constructed, and maintained in accordance with the requirements for temporary impoundments. Such structures may not be retained permanently as part of the approved postmining land use.

Each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of 30 CFR Sec. 77.216(a) shall have sufficient spillway capacity to safely pass, adequate storage capacity to safely contain, or a combination of storage capacity and spillway capacity to safely control, the probable maximum precipitation of a 6-hour precipitation event, or greater event as specified by the Division. Spillways and outlet works shall be designed to provide adequate protection against erosion and corrosion. Inlets shall be protected against blockage.

Runoff from areas above the disposal facility or runoff from the surface of the facility that may cause instability or erosion of the impounding structure shall be diverted into a stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour design precipitation event.

Impounding structures constructed of or impounding coal mine waste shall be designed and function so that at least 90 percent of the water stored during the design precipitation event can be removed within a 10-day period.

Burning and burned waste utilization

Coal mine waste fires shall be extinguished by the person who conducts the surface mining activities, in accordance with a plan approved by the Division and the Mine Safety and Health Administration. The plan shall contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, shall be involved in the extinguishing operations. No burning or unburned coal mine waste shall be removed from a permitted disposal area without a removal plan approved by the Division. Consideration shall be given to potential hazards to persons working or living in the vicinity of the structure.

Return of coal processing waste to abandoned underground workings

Each plan shall describe the design, operation and maintenance of any proposed coal processing waste disposal facility, including flow diagrams and any other necessary drawings and maps, for the approval of the Division and the Mine Safety and Health Administration.

Each plan shall describe the source and quality of waste to be stowed, area to be backfilled, percent of the mine void to be filled, method of constructing underground retaining walls, influence of the backfilling operation on active underground mine operations, surface area to be supported by the backfill, and the anticipated occurrence of surface effects following backfilling.

The applicant shall describe the source of the hydraulic transport mediums, method of dewatering the placed backfill, retainment of water underground, treatment of water if released to surface streams, and the effect on the hydrologic regime.

The plan shall describe each permanent monitoring well to be located in the backfilled area, the stratum underlying the mined coal, and gradient from the backfilled area.

The requirements of this section shall also apply to pneumatic backfilling operations, except where the operations are exempted by the Division from requirements specifying hydrologic monitoring.

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Excess Spoil: General Requirements

Excess spoil shall be placed in designated disposal areas within the permit area, in a controlled manner to: minimize the adverse effects of leachate and surfacewater runoff from the fill on surface and ground waters; ensure mass stability and prevent mass movement during and after construction; and, ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.

The fill and appurtenant structures shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Division. A qualified registered professional engineer experienced in the design of earth and rock fills shall certify the design of the fill and appurtenant structures. The fill shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill must be stable under all conditions of construction.

The disposal area shall be located on the most moderately sloping and naturally stable areas available, as approved by the Division, and shall be placed, where possible, upon or above a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement.

Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures. When the slope in the disposal area is in excess of 2.8h:1v (36 percent), or such lesser slope as may be designated by the Division based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to ensure stability of the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed to determine the size of rock toe buttresses and keyway cuts.

All vegetative and organic materials shall be removed from the disposal area prior to placement of excess spoil. Topsoil shall be removed, segregated and stored and redistributed in accordance with the requirements for topsoil handling. If approved by the Division, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

Excess spoil shall be transported and placed in a controlled manner in horizontal lifts not exceeding 4 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material. The Division may approve a design which incorporates placement of excess spoil in horizontal lifts other than 4 feet in thickness when it is demonstrated by the operator and certified by a qualified registered professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.

The final configuration of the fill shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:1v (50 percent).

No permanent impoundments are allowed on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with the stability of the fill.

Excess spoil that is acid- or toxic-forming or combustible shall be adequately covered with nonacid, nontoxic and noncombustible material, or treated, to control the impact on surface and ground water, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill, and ensure stability. Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices and meet any design criteria established by the Division. The underdrain system shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid-, nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone, or other durable rock) that does not slake in water or degrade to soil materials, and which is free of coal, clay, or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

Slope protection shall be provided to minimize surface erosion at the site. All distributed areas, including diversion channels that are not riprapped or otherwise protected, shall be revegetated upon completion of construction.

A qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer, shall periodically inspect the fill during construction. The professional engineer or specialist shall be experienced in the construction of earth and rock fills. Such inspections shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include at a minimum: foundation preparation, including

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the removal of all organic material and topsoil; placement of underdrains and protective filter systems; installation of final surface drainage systems; and, the final graded and revegetated fill. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of fill materials. The qualified registered professional engineer shall provide a certified report to the Division promptly after each inspection that the fill has been constructed and maintained as designed and in accordance with the regulatory requirements. The report shall include appearances of instability, structural weakness, and other hazardous conditions. The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with excess spoil. If the underdrain system is constructed in phases, each phase shall be certified separately. Where excess durable rock spoil is placed in single or multiple lifts such that the underdrain system is constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, color photographs shall be taken of the underdrain as the underdrain system is being formed. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report shall be retained at or near the mine site.

Coal mines waste may be disposed of in excess spoil fills if approved by the Division and, if such waste is: placed in accordance with the requirements for refuse piles; nontoxic and nonacid forming; and, of the proper characteristics to be consistent with the design stability of the fill.

Spoil resulting from face-up operations for underground coal mine development may be placed at drift entries as part of a cut-and-fill structure, if the structure is less than 400 feet in horizontal length and designed in accordance with the general requirements for the disposal of excess spoil.

Excess Spoil: Valley fills/head-of-hollow fills

Valley fills and head-of-hollow fills shall meet the general requirements for excess spoil and the following additional requirements.

The top surface of the completed fill shall be graded such that the final slope after settlement will be toward properly designed drainage channels. Uncontrolled surface drainage may not be directed over the outslope of the fill. Runoff from areas above the fill and runoff from the surface of the fill shall be diverted into stabilized diversion channels and to safely pass the runoff from a 100-year, 6-hour precipitation event.

A rock-core chimney drain may be used in a head-of-hollow fill, instead of the underdrain and surface diversion system normally required, as long as the fill is not located in an area containing intermittent or perennial streams. A rock-core chimney drain may be used in a valley fill if the fill does not exceed 250,000 cubic yards of material and upstream drainage is diverted around the fill. The alternative rock-core chimney drain system shall be incorporated into the design and construction of the fill as follows:

- 1.) The fill shall have, along the vertical projection of the main buried stream channel or rill, a vertical core of the durable rock at least 16 feet thick which shall extend from the toe of the fill to the head of the fill and from the base of the fill to the surface of the fill. A system of lateral rock underdrains shall connect this rock core to each area of potential drainage or seepage in the disposal area. The underdrain system and rock core shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area.
- 2.) A filter system to ensure the proper long-term functioning of the rock core shall be designed and constructed using current, prudent engineering practices.
- 3.) Grading may drain surface water away from the outslope of the fill and toward the rock core. In no case, however, may intermittent or perennial streams be diverted into the rock core. The maximum slope of the top of the fill shall be 33h:1v (3 percent). A drainage pocket may be maintained at the head of the fill during and after construction, to intercept surface runoff and discharge the runoff through or over the rock drain, if stability of the fill is not impaired. In no case shall this pocket or sump have a potential capacity for impounding more than 10,000 cubic feet of water. Terraces on the fill shall be graded with a 3- to 5-percent grade toward the fill and a 1-percent slope toward the rock core.

Excess Spoil: Durable rock fills

The Division may approve the alternative method of disposal of excess durable rock spoil by gravity placement in single or multiple lifts, provided the following conditions are met: durable rock fills shall meet the general requirements for excess spoil except as provided in this section; the excess spoil consists of at least 80 percent, by volume, durable, nonacid- and nontoxic-forming rock (e.g., sandstone or limestone) that does not slake in water and will not degrade to soil material. Where used, noncemented clay shale, clay spoil, soil, or other nondurable excess spoil material shall be mixed with excess durable rock spoil in a controlled manner such that no more than 20 percent of the fill volume, as determined by tests performed by a registered engineer and approved by the Division, is not durable rock; a qualified registered professional engineer certifies that the design will ensure the stability of the fill and meet all other applicable requirements; the fill is designed to attain a minimum long-term static safety factor of 1.5, and an earthquake safety factor of 1.1; the underdrain system may be constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, provided the resulting underdrain system is capable of carrying anticipated seepage of

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water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and the other requirements for drainage control are met; and, surface water runoff from areas adjacent to and above the fill is not allowed to flow onto the fill and is diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event.

Excess Spoil: Preexisting benches

The Division may approve the disposal of excess spoil through placement on preexisting benches, provided that the general requirements for excess spoil and the requirements of this section are met.

Excess spoil shall be placed only on the solid portion of the preexisting bench. The fill shall be designed, using current, prudent engineering practices, to attain a long-term static safety factor of 1.3 for all portions of the fill. The preexisting bench shall be backfilled and graded to achieve the most moderate slope possible which does not exceed the angle of repose, and eliminate the highwall to the maximum extent technically practical.

Disposal of excess spoil from an upper actively mined bench to a lower preexisting bench by means of gravity transport may be approved by the Division provided that: the gravity transport courses are determined on a site-specific basis by the operator as part of the permit application and approved by the Division to minimize hazards to health and safety and to ensure that damage will be minimized between the benches, outside the set course, and downslope of the lower bench should excess spoil accidentally move; all gravity-transported excess spoil, including that excess spoil immediately below the gravity transport courses and any preexisting spoil that is disturbed, is rehandled and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and to prevent mass movement, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and to ensure a minimum long-term static safety factor of 1.3. Excess spoil on the bench prior to the current mining operation that is not disturbed need not be rehandled except where necessary to ensure stability of the fill; a safety berm is constructed on the solid portion of the lower bench prior to gravity transport of the excess spoil. Where there is insufficient material on the lower bench to construct a safety berm, only that amount of excess spoil necessary for the construction of the berm may be gravity transported to the lower bench prior to construction of the berm; and, excess spoil shall not be allowed on the downslope below the upper bench except on designated gravity-transport courses properly prepared by removing topsoil. Upon completion of the fill, no excess spoil shall be allowed to remain on the designated gravity-transport course between the two benches and each transport course shall be reclaimed.

Analysis:

No modification to the spoil and waste material-handling program is necessary due to the addition of the Whitmore Lease. The spoil and waste materials program includes: Disposal of noncoal waste, Coal mine waste, Refuse piles, Impounding structures, Burning and burned waste utilization, Return of coal processing waste to abandoned underground workings, and Excess spoil.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operational Plan – Spoil and Waste Materials section of the regulations.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Minimum Regulatory Requirements:

General

All underground mining and reclamation activities shall be conducted to minimize disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this part. The Division may require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented. Mining and reclamation practices that minimize water pollution and changes in flow shall be used in preference to water treatment.

Groundwater Monitoring

In order to protect the hydrologic balance underground mining activities shall be conducted according to the hydrologic reclamation plan. Ground-water quality shall be protected by handling earth materials and runoff in a manner that minimizes acidic, toxic, or other harmful infiltration to ground-water systems and by managing excavations and other disturbances to prevent or control the discharge of pollutants into the ground water.

Ground-water monitoring shall be conducted according to the ground-water monitoring plan. The Division may require additional monitoring when necessary. Ground-water monitoring data shall be submitted every 3 months to the Division or more frequently as prescribed by the Division. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. Plans and hydrologic information to evaluate and mitigate the noncompliance situation and information relevant to the PHC shall be submitted to the Division as required.

Ground-water monitoring shall proceed through mining and continue during reclamation until bond release. The Division may modify the monitoring requirements including the parameters covered and the sampling frequency if the operator demonstrates, using the monitoring data obtained, that: the operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; or, monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan.

Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of ground water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

Surface Water Monitoring

In order to protect the hydrologic balance, underground mining activities shall be conducted according to the approved plan, and the following: surface-water quality shall be protected by handling earth materials, ground-water discharges, and runoff in a manner that minimizes the formation of acidic or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contribution of suspended solids to streamflow outside the permit area; and otherwise prevent water pollution. If drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching, or other reclamation and remedial practices are not adequate to meet water-quality standards and effluent limitations, the operator shall use and maintain the necessary water-treatment facilities or water-quality controls. Surface-water quantity and flow rates shall be protected by handling earth materials and runoff in accordance with the steps outlined in the approved plan.

Surface-water monitoring shall be conducted according to the approved surface-water monitoring plan. The Division may require additional monitoring when necessary. Surface-water monitoring data shall be submitted every 3 months to the Division or more frequently as prescribed by the Division. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any surface-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. Plans and hydrologic information to evaluate and

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mitigate the noncompliance situation and information relevant to the PHC shall be submitted to the Division as required. The reporting requirements of the water monitoring plan do not exempt the operator from meeting any National Pollutant Discharge Elimination System (NPDES) reporting requirements.

Surface-water monitoring shall proceed through mining and continue during reclamation until bond release. The Division may modify the monitoring requirements, except those required by the NPDES permitting authority, including the parameters covered and sampling frequency if the operator demonstrates, using the monitoring data obtained, that: the operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; and, monitoring is no longer necessary to achieve the purposes set forth in the approved monitoring plan.

Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of surface water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

Acid- and toxic-forming materials and underground development waste

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water shall be avoided by: identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated; and, storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff, and the infiltration of polluted water.

Discharges into an underground mine

Discharges into an underground mine are prohibited, unless specifically approved by the Division after a demonstration that the discharge will: minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area and otherwise eliminate public hazards resulting from underground mining activities; not result in a violation of applicable water quality standards or effluent limitations; be at a known rate and quality which shall meet the effluent limitations for pH and total suspended solids, except that the pH and total suspended solids limitations may be exceeded, if approved by the Division; and, meet with the approval of the Mine Safety and Health Administration.

Discharges shall be limited to the following: water; coal-processing waste; fly ash from a coal-fired facility; sludge from an acid-mine-drainage treatment facility; flue-gas desulfurization sludge; inert materials used for stabilizing underground mines; and, underground mine development wastes.

Water from one underground mine may be diverted into other underground workings according to the requirements of this section.

Gravity discharges from underground mines

Surface entries and accesses to underground workings shall be located and managed to prevent or control gravity discharge of water from the mine. The surface entries and accesses of drift mines first used after the implementation of a State, Federal, or Federal Lands Program and located in acid-producing or iron-producing coal seams shall be located in such a manner as to prevent any gravity discharge from the mine. Gravity discharges of water from an underground mine first used before the implementation of a State, Federal, or Federal Lands Program, may be allowed by the Division if it is demonstrated that the untreated or treated discharge complies with the performance standards and any additional NPDES permit requirements.

Water-quality standards and effluent limitations

Compliance with all applicable State and Federal water quality laws and regulations and with the effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

Diversions: General

With the approval of the Division, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions shall be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions shall not be used to divert water into underground mines without approval of the Division.

The diversion and its appurtenant structures shall be designed, located, constructed, and maintained to: be stable; provide protection against flooding and resultant damage to life and property; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, comply with all applicable local, State, and Federal laws and regulations.

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Temporary diversions shall be removed when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process shall be restored. Before diversions are removed, downstream water-treatment facilities previously protected by the diversion shall be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement shall not relieve the operator from maintaining water-treatment facilities as otherwise required.

A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat. The Division may specify additional design criteria for diversions.

Diversions: Perennial and intermittent streams

Diversion of perennial and intermittent streams within the permit area may be approved by the Division after making the finding relating to stream buffer zones that the diversions will not adversely affect the water quantity and quality and related environmental resources of the stream. The design capacity of channels for temporary and permanent stream channel diversions shall be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion. The design and construction of all stream channel diversions of perennial and intermittent streams shall be certified by a qualified registered professional engineer as meeting the performance standards and any design criteria set by the Division.

Diversions: Miscellaneous flows

Diversion of miscellaneous flows, which consist of all flows except for perennial and intermittent streams, may be diverted away from disturbed areas if required or approved by the Division. Miscellaneous flows shall include ground-water discharges and ephemeral streams. The design, location, construction, maintenance, and removal of diversions of miscellaneous flows shall meet all of the general performance standards of this section. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for miscellaneous flows are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 2-year, 6-hour precipitation event for a temporary diversion and a 10-year, 6-hour precipitation event for a permanent diversion.

Stream buffer zones

No land within 100 feet of a perennial stream or an intermittent stream shall be disturbed by underground mining activities, unless the Division specifically authorizes underground mining activities closer to, or through, such a stream. The Division may authorize such activities only upon finding that: underground mining activities will not cause or contribute to the violation of applicable State or Federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of the stream; and, if there will be a temporary or permanent stream-channel diversion, it will comply with the regulatory requirements for diversions.

The area not to be disturbed shall be designated as a buffer zone, and the operator shall mark it accordingly with buffer zone markers.

Sediment control measures

Appropriate sediment control measures shall be designed, constructed, and maintained using the best technology currently available to: prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area; meet the more stringent of applicable State or Federal effluent limitations; and, minimize erosion to the extent possible.

Sediment control measures include practices carried out within and adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed areas shall reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods include but are not limited to: disturbing the smallest practicable area at any one time during the mining operation through progressive backfilling, grading, and prompt revegetation; stabilizing the backfilled material to promote a reduction of the rate and volume of runoff; retaining sediment within disturbed areas; diverting runoff away from disturbed areas; diverting runoff using protected channels or pipes through disturbed areas so as not to cause additional erosion; using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds, and other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment; treating with chemicals; and, treating mine drainage in underground sumps.

Siltation Structures: General

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All surface drainage from disturbed areas shall be passed through a siltation structure before leaving the permit area. Siltation structures shall mean a sedimentation pond, a series of sedimentation ponds, or other treatment facility. Other treatment facilities means any chemical treatments, such as flocculation, or mechanical structures, such as clarifiers, that have a point-source discharge and that are utilized to prevent additional contribution of suspended solids to streamflow or runoff outside the permit area.

Disturbed area requiring treatment through a siltation structure shall not include those areas in which the only underground mining activities include: diversion ditches, siltation structures, or roads that are designed, constructed and maintained in accordance with the regulatory requirements; and, for which the upstream area is not otherwise disturbed by the operator.

Additional contributions of suspended solids and sediment to streamflow or runoff outside the permit area shall be prevented to the extent possible using the best technology currently available. Siltation structures for an area shall be constructed before beginning any underground mining activities in that area, and upon construction shall be certified by a qualified registered professional engineer, or when authorized under the regulations, by a qualified registered professional land surveyor, to be constructed as designed and as approved in the reclamation plan.

Any siltation structure which impounds water shall be designed, constructed and maintained in accordance with the requirements for impoundments.

Siltation structures shall be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated. In no case shall the structure be removed sooner than 2 years after the last augmented seeding. When the siltation structure is removed, the land on which the siltation structure was located shall be regraded and revegetated in accordance with the reclamation plan. Sedimentation ponds approved by the Division for retention as permanent impoundments may be exempted from this requirement.

Any point-source discharge of water from underground workings to surface waters which does not meet effluent limitations shall be passed through a siltation structure before leaving the permit area.

Siltation Structures: Sedimentation ponds

Sedimentation ponds, when used, shall: be used individually or in series; be located as near as possible to the disturbed area and out of perennial streams unless approved by the Division; and, be designed, constructed, and maintained to:

- 1.) Provide adequate sediment storage volume;
- 2.) Provide adequate detention time to allow the effluent from the ponds to meet State and Federal effluent limitations;
- 3.) Contain or treat the 10-year, 24-hour precipitation event ("design event") unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and on a demonstration by the operator that the effluent limitations will be met;
- 4.) Provide a nonlogging dewatering device adequate to maintain the required time;
- 5.) Minimize, to the extent possible, short circuiting;
- 6.) Provide periodic sediment removal sufficient to maintain adequate volume for the design event;
- 7.) Ensure against excessive settlement;
- 8.) Be free of sod, large roots, frozen soil, and acid- or toxic-forming coal-processing waste; and
- 10.) Be compacted properly.

A sedimentation pond shall include either a combination of principal and emergency spillways or a single open-channel spillway configured as specified in this section, designed and constructed to safely pass the applicable design precipitation event. The Division may approve a single open-channel spillway that is: of nonerodible construction and designed to carry sustained flows; or earth- or grass-lined and designed to carry short-term infrequent flows at non-erosive velocities where sustained flows are not expected.

The required design precipitation event for a sedimentation pond meeting the spillway requirements of this section is: for a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 100-year 6-hour event, or greater event as specified by the Division; or, for a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 25-year 6-hour event, or greater event as specified by the Division.

In lieu of meeting the above spillway requirements, the Division may approve a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or, as applicable, a qualified registered professional land surveyor that: the sedimentation pond will safely control the design precipitation event; the water from which shall be safely removed in accordance with current, prudent, engineering practices; and, such a sedimentation pond shall be located where failure would not be expected to cause loss of life or serious property damage. If the sediment pond is located where failure would be expected to cause loss of life or serious property damage, a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event may be allowed if, in addition to the design event, is: in the case of a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as

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specified by the Division; or, in the case of a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the Division.

Siltation Structures: Other treatment facilities

Other treatment facilities shall be designed to treat the 10-year, 24-hour precipitation even unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and a demonstration by the operator that the effluent limitations will be met. Other treatment facilities shall be designed, constructed and maintained accordance with the applicable requirements as described under sediment ponds.

Siltation Structures: Exemptions

Exemptions to the requirements of this section may be granted if: the disturbed drainage area within the total disturbed area is small; and, the operator demonstrates that siltation structures and alternate sediment control measures are not necessary for drainage from the disturbed drainage areas to meet effluent limitations and applicable State and Federal water-quality standards for the receiving waters.

Discharge structures

Discharge from sedimentation ponds, permanent and temporary impoundments, coal processing waste dams and embankments, and diversions shall be controlled, by energy dissipators, riprap channels, and other devices, where necessary, to reduce erosion, to prevent deepening or enlargement of stream channels, and to minimize disturbance of the hydrologic balance. Discharge structures shall be designed according to standard engineering design procedures.

Impoundments

The following requirements apply to both temporary and permanent impoundments:

- 1.) An impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) shall comply with the requirements of 30 CFR Sec. 77.216 and this section.
- 2.) The design of impoundments shall be certified as designed to meet the requirements of the regulations using current, prudent, engineering practices and any design criteria established by the Division. The qualified, registered, professional engineer or qualified, registered, professional, land surveyor shall be experienced in the design and construction or impoundments.
- 3.) An impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) or located where failure would be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.5 for a normal pool with steady state seepage saturation conditions, and a seismic safety factor of at least 1.2. Impoundments not meeting the size or other criteria of 30 CFR Sec. 77.216(a), except for a coal mine waste impounding structure, and located where failure would not be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions. For an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), where failure would not be expected to cause loss of life or serious property damage, the Division may establish engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3.
- 4.) Impoundments shall have adequate freeboard to resist overtopping by waves and by sudden increases in storage volume.
- 5.) Foundations and abutments for an impounding structure shall be stable during all phases of construction and operation and shall be designed based on adequate and accurate information on the foundation conditions. For an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a), foundation investigation, as well as any necessary laboratory testing of foundation material, shall be performed to determine the design requirements for foundation stability. All vegetative and organic materials shall be removed and foundations excavated and prepared to resist failure. Cutoff trenches shall be installed if necessary to ensure stability.
- 6.) Slope protection shall be provided to protect against surface erosion at the site and protect against sudden drawdown.
- 7.) Faces of embankments and surrounding areas shall be vegetated, except that faces where water is impounded may be riprapped or otherwise stabilized in accordance with accepted design practices.
- 8.) Spillways: An impoundment shall include either a combination of principal and emergency spillways, a single open-channel spillway, or, be configured as an impoundment that relies primarily on storage to control the runoff from the applicable design precipitation event. The Division may approve a single open-channel spillway that is of nonerodible construction and designed to carry sustained flows; or, earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected. Except impoundments that rely primarily on storage to control the runoff, the required design precipitation events for an impoundment having spillways are: for an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) a 100-year 6-hour event, or greater event as specified by the Division; and, for an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 25-year 6-hour event, or greater event as

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specified by the Division. In lieu of meeting the single open-channel spillway requirements, the Division may approve an impoundment that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor that the impoundment will safely control the design precipitation event, the water from which shall be safely removed in accordance with current, prudent, engineering practices. Such an impoundment shall be located where failure would not be expected to cause loss of life or serious property damage, except where: in the case of an impoundment meeting the size or other criteria of 30 CFR Sec.

77.216(a), it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the Division; or, in the case of an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the Division.

- 9.) The vertical portion of any remaining highwall shall be located far enough below the low-water line along the full extent of highwall to provide adequate safety and access for the proposed water users.
- 10.) Inspections: Except as provided in paragraph (a)(10)(iv) of this section, a qualified registered professional engineer or other qualified professional specialist under the direction of a professional engineer, shall inspect each impoundment as provided in paragraph (a)(10)(i) of this section. The professional engineer or specialist shall be experienced in the construction of impoundments.

Inspections shall be made regularly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond. The qualified registered professional engineer, or qualified registered professional land surveyor as applicable, shall promptly after each inspection provide to the Division a certified report that the impoundment has been constructed and/or maintained as designed and in accordance with the approved plan and this section. The report shall include discussion of any appearance of instability, structural weakness or other hazardous condition, depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability. A copy of the report shall be retained at or near the minesite.

A qualified registered professional land surveyor may inspect any temporary or permanent impoundment that does not meet the size or other criteria of 30 CFR Sec. 77.216(a) and certify and submit the report required above, except that all coal mine waste impounding structures shall be certified by a qualified registered professional engineer. The professional land surveyor shall be experienced in the construction of impoundments. Impoundments subject to 30 CFR Sec. 77.216 must be examined in accordance with 30 CFR Sec. 77.216-3. Other impoundments shall be examined at least quarterly by a qualified person designated by the operator for appearance of structural weakness and other hazardous conditions.

If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment shall promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division shall be notified immediately. The Division shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

A permanent impoundment of water may be created, if authorized by the Division in the approved permit based upon the following demonstration:

- 1.) The size and configuration of such impoundment will be adequate for its intended purposes.
- 2.) The quality of impounded water will be suitable on a permanent basis for its intended use and, after reclamation, will meet applicable State and Federal water quality standards, and discharges from the impoundment will meet applicable effluent limitations and will not degrade the quality of receiving water below applicable State and Federal water quality standards.
- 3.) The water level will be sufficiently stable and be capable of supporting the intended use.
- 4.) Final grading will provide for adequate safety and access for proposed water users.
- 5.) The impoundment will not result in the diminution of the quality and quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic uses.
- 6.) The impoundment will be suitable for the approved postmining land use.

The Division may authorize the construction of temporary impoundments as part of underground mining activities.

Ponds, impoundments, banks, dams, and embankments

Each application shall include a general plan for each proposed sedimentation pond, water impoundment, and coal processing waste bank, dam, or embankment within the proposed permit area. Each general plan shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor with assistance from experts in related fields such as landscape architecture;
- 2.) Contain a description, map, and cross section of the structure and its location;
- 3.) Contain preliminary hydrologic and geologic information required to assess the hydrologic impact of the

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- structure;
- 4.) Contain a survey describing the potential effect on the structure from subsidence of the subsurface strata resulting from past underground mining operations if underground mining has occurred; and
 - 5.) Contain a certification statement which includes a schedule setting forth the dates when any detailed design plans for structures that are not submitted with the general plan will be submitted to the Division. The Division shall have approved, in writing, the detailed design plan for a structure before construction of the structure begins.

Each detailed design plan for a structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture;
- 2.) Include any geotechnical investigation, design, and construction requirements for the structure;
- 3.) Describe the operation and maintenance requirements for each structure; and
- 4.) Describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for a structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments covered by Sections 817.81-817.84 of this Chapter shall be certified by a qualified, registered, professional engineer;
- 2.) Include any design and construction requirements for the structure, including any required geotechnical information;
- 3.) Describe the operation and maintenance requirements for each structure; and
- 4.) Describe the timetable and plans to remove each structure, if appropriate.

Sedimentation ponds, whether temporary or permanent, shall be designed in compliance with the requirements of Siltation Structures. Any sedimentation pond or earthen structure which will remain on the proposed permit area as a permanent water impoundment shall also be designed to comply with the requirements for Impoundments. Each plan shall, at a minimum, comply with the requirements of the Mine Safety and Health Administration, 30 CFR Sections 77.216-1 and 77.216-2.

Permanent and temporary impoundments shall be designed to comply with the requirements for Impoundments. Each plan for an impoundment meeting the size of other criteria of the Mine Safety and Health Administration shall comply with the requirements of 30 CFR Sec. 77.216-1 and 77.216-2. The plan required to be submitted to the District Manager of MSHA under Sec. 77.216 of this title shall be submitted to the Division as part of the permit application. For an impoundment not meeting the size of other criteria of 30 CFR Sec. 77.216(a) and located where failure would not be expected to cause loss of life or serious property damage, the Division may establish through the State program approval process engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3.

Coal processing waste banks, dams and embankments shall be designed to comply with the requirements for Coal Mine Waste. Each plan shall comply with the requirements of the Mine Safety and Health Administration, 30 CFR Sections 77.216-1 and 77.216-2, and shall contain the results of a geotechnical investigation of the proposed dam or embankment foundation area, to determine the structural competence of the foundation which will support the proposed dam or embankment structure and the impounded material. The geotechnical investigation shall be planned and supervised by an engineer or engineering geologist, according to the following:

- 1.) The number, location, and depth of the borings and test pits shall be determined using current prudent engineering practice for the size of the dam or embankment, quantity of material to be impounded, and subsurface conditions.
- 2.) The character of the overburden and bedrock, the proposed abutment sites, and any adverse geotechnical conditions which may affect the particular dam, embankment, or reservoir site shall be considered.
- 3.) All springs, seepage, and ground-water flow observed or anticipated during wet periods in the area of the proposed dam or embankment shall be identified on each plan.
- 4.) Consideration shall be given to the possibility of mudflows, rock-debris falls, or other landslides into the dam, embankment, or impounded material.

If the structure is 20 feet or higher or impounds more than 20 acre-feet, each plan of this section shall include a stability analysis of each structure. The stability analysis shall include, but not be limited to, strength parameters, pore pressures, and long-term seepage conditions. The plan shall also contain a description of each engineering design assumption and calculation with a discussion of each alternative considered in selecting the specific design parameters and construction methods.

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Analysis:

General

Topics covered below are the only items that required modification or additional review from the currently approved MRP. No additional surface facilities are being constructed, and no modification to the following is anticipated; Transfer of wells, Discharges into an underground mine, Diversions, Sediment control measures, Siltation structures, Sediment ponds, Other treatment facilities, Exemptions from siltation structures, Discharge structures, Impoundments, Ponds, impoundments, Banks, Dams, and Embankments, and Casing and sealing of wells.

Ground-Water Monitoring

Spring S-80 (Hanging Rock Spring), located in Hanging Rock Spring Canyon, will be added to the Operational Water Monitoring Plan to further characterize the potential impacts to the area.

Well DH86-2 had previously been identified as collecting water -level only in the MRP. Updated in the February 2, 2002 submittal, the water monitoring at Well DH86-2 has been correctly identified to record both field parameters and water quality analysis. This is reflected in text on Page 7-22a and Table 7-1.

Surface-Water Monitoring

Stream sites ST-10 and ST-9, located at the upper permit boundary and the inlet of Grassy Trail Reservoir, respectively, will be added to the Operational Water Monitoring Plan to further characterize the potential impacts to Grassy Trail Creek.

Page 7-21 and Table 7-5 describe Operational Surface Water monitoring locations. Sites ST-5, ST-6A, ST-6 and ST-7 have crest gauges installed, and the channel dimensions in these locations have been surveyed. Updated in the February 2, 2002 submittal, a clarifying statement has been added to the monitoring plan that crest gauge measurements will be recorded and calculated flows will be documented in the quarterly monitoring data. This is referenced in text on Page 7-22 and in Tables 7-1 and 7-2.

Acid- and Toxic-Forming Materials

Within the 1998 Mayo and Associates report, the report indicates no anticipated Acid or toxic-forming waters will be produced or discharged from the mine. This was demonstrated with the use of in-mine waters from the Sunnyside mine and various surface waters in the area. Acid mine drainage is generally not a concern based on the abundant carbonate mineral in the coal-bearing stratum and the relatively low sulfur concentration within the coal. The dissolution of carbonate minerals quickly consumes any acid produced from the oxidation of pyrite.

Gravity Discharges

The strike and dip of the coal seam is toward the workings and away from any and all portals. No Gravity discharges are anticipated.

Water Quality Standards and Effluent Limitations

No changes or modifications are necessary to the currently approved permit.

Stream Buffer Zones

Grassy Trail Creek is projected to be undermined in Whitmore Canyon, above Grassy Trail Reservoir. Although mining will be conducted within 100 feet of the stream horizontally, vertically it will actually be approximately 2000 feet away. Due to the hydrophyllic clays within the overlying North Horn Formation, the potential for interception and diminution of surface water flows in Grassy Trail Creek as a result of mining-induced subsidence is minimal. The applicant adds supporting documentation on Page 7-30 through 7-31.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operational Plan – Hydrologic Information section of the regulations.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR 784.30, 817.180, 817.181; R645-301-526.

Minimum Regulatory Requirements:

Each applicant for an underground coal mining and reclamation permit shall submit a description, plans, and drawings for each support facility to be constructed, used, or maintained within the proposed permit area. The plans and drawings shall include a map, appropriate cross sections, design drawings, and specifications sufficient to demonstrate compliance.

Support facilities shall be operated in accordance with a permit issued for the mine or coal preparation plant to which it is incident or from which its operation results. In addition to the other provisions of this part, support facilities shall be located, maintained, and used in a manner that: prevents or controls erosion and siltation, water pollution, and damage to public or private property; and, to the extent possible using the best technology currently available, minimizes damage to fish, wildlife, and related environmental values and minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any such contributions shall not be in excess of limitations of State or Federal law.

All surface and underground mining activities shall be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal-slurry pipelines, railroads; electric and telephone lines; and water and sewage lines which pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the Division.

Support facilities shall be operated in accordance with a permit issued for the mine or coal preparation plant to which it is incident or from which its operation results. In addition to the other provisions of this part, support facilities shall be located, maintained, and used in a manner that prevents or controls erosion and siltation, water pollution, and damage to public or private

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property. Support facilities shall, to the extent possible using the best technology currently available, minimize damage to fish, wildlife, and related environmental values; and, minimize additional contributions of suspended solids to streamflow or runoff outside the permit area. Any such contributions shall not be in excess of limitations of State or Federal law.

Analysis:

No additional support facilities will be used in connection with the Whitmore lease. No modification to the current MRP is necessary.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operational Plan – Support Facilities and Utility Installation section of the regulations.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR 817.11; R645-301-521.

Minimum Regulatory Requirements:

Signs and markers shall: be posted, maintained, and removed by the person who conducts the underground mining activities; be of a uniform design throughout the activities that can be easily seen and read; be made of durable material; and, conform to local laws and regulations. Signs and markers shall be maintained during all activities to which they pertain.

Mine and permit identification signs shall be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas for underground mining activities. Signs will show the name, business address, and telephone number of the person who conducts underground mining activities and the identification number of the current regulatory program permit authorizing underground mining activities. Signs shall be retained and maintained until after the release of all bonds for the permit area.

Perimeter markers shall clearly mark the perimeter of all areas affected by surface operations or facilities before beginning mining activities.

Buffer zones shall be clearly marked to prevent disturbance by surface operations and facilities.

Topsoil markers shall be used where topsoil or other vegetation-supporting material is segregated and stockpiled.

Analysis:

No additional signs or markers will need to be placed as a result of the Whitmore lease. No modification to the current MRP is necessary.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operational Plan – Signs and Markers section of the regulations.

USE OF EXPLOSIVES

Regulatory Reference: 30 CFR 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

Minimum Regulatory Requirements:

General Requirements

These requirements apply to surface blasting activities incident to underground coal mining, including, but not limited to, initial rounds of slopes and shafts. Each operator shall comply with all applicable State and Federal laws and regulations in the use of explosives.

All surface blasting operations incident to underground mining shall be conducted under the direction of a certified blaster. Certificates of blaster certification shall be carried by blasters or shall be on file at the permit area during blasting operations. A blaster and at least one other person shall be present at the firing of a blast. Any blaster who is responsible for conducting blasting operations at a blasting site shall be familiar with the site-specific performance standards and give direction and on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

An anticipated blast design shall be submitted if blasting operations will be conducted within 1,000 feet of any building used as a dwelling, public building, school, church or community or institutional building or 500 feet of active or abandoned underground mines. The blast design may be presented as part of a permit application or at a time, before the blast, approved by the Division. The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected, as well as a discussion of design factors to be used, which protect the public and meet the applicable airblast, flyrock, and ground-vibration standards. The blast design shall be prepared and signed by a certified blaster. The Division may require changes to the design submitted.

Preblasting survey

At least 30 days before initiation of blasting, the operator shall notify, in writing, all residents or owners of dwellings or other structures located within 1/2 mile of the permit area how to request a preblasting survey. A resident or owner of a dwelling or structure within 1/2 mile of any part of the permit area may request a preblasting survey. This request shall be made, in writing, directly to the operator or to the Division, who shall promptly notify the operator. The operator shall promptly conduct a preblasting survey of the dwelling or structure and promptly prepare a written report of the survey. An updated survey of any additions, modifications, or renovations shall be performed by the operator if requested by the resident or owner.

The operator shall determine the condition of the dwelling or structure and shall document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, and transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data. The written report of the survey shall be signed by the person who conducted the survey. Copies of the report shall be promptly provided to the Division and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both the operator and the Division a detailed description of the specific areas of disagreement. Any surveys requested more than 10 days before the planned initiation of blasting shall be completed by the operator before the initiation of blasting.

General performance standards

The operator shall notify, in writing, residents within 1/2 mile of the blasting site and local governments of the proposed times and locations of blasting operations. Such notice of times that blasting is to be conducted may be announced weekly, but in no case less than 24 hours before blasting will occur. Unscheduled blasts may be conducted only where public or operator health and safety so require and for emergency blasting actions. When an operator conducts an unscheduled surface blast incidental to underground coal mining operations, the operator, using audible signals, shall notify residents within 1/2 mile of the blasting site and

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document the reason. All blasting shall be conducted between sunrise and sunset unless nighttime blasting is approved by the Division based upon a showing by the operator that the public will be protected from adverse noise and other impacts. The Division may specify more restrictive time periods for blasting.

Blasting signs, warnings, and access control

The operator shall conspicuously place signs reading "Blasting Area" along the edge of any blasting area that comes within 100 feet of any public-road right-of-way, and at the point where any other road provides access to the blasting area and at all entrances to the permit area from public roads or highways, place conspicuous signs which state "Warning! Explosives in Use," which clearly list and describe the meaning of the audible blast warning and all-clear signals that are in use, and which explain the marking of blasting areas and charged holes awaiting firing within the permit area.

Warning and all-clear signals of different character or pattern that are audible within a range of 1/2 mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within 1/2 mile of the permit area shall be notified of the meaning of the signals in the blasting notification.

Access within the blasting areas shall be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of the operator has reasonably determined that no unusual hazards, such as imminent slides or undetonated charges, exist and access to and travel within the blasting area can be safely resumed.

Control of adverse effects

Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

Airblast shall not exceed the maximum limits specified in the regulations at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area. The maximum airblast and ground-vibration standards shall not apply at structures owned by the permittee and not leased to another person or at structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the Division before blasting.

Flyrock travelling in the air or along the ground shall not be cast from the blasting site: more than one-half the distance to the nearest dwelling or other occupied structure; beyond the area of control; or beyond the permit boundary.

In all blasting operations, except as otherwise authorized, the maximum ground vibration shall not exceed the values approved by the Division. All structures in the vicinity of the blasting area, such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the operator and approved by the Division before the initiation of blasting.

The maximum allowable ground vibration shall be reduced by the Division beyond the limits otherwise provided by this section, if determined necessary to provide damage protection. The Division may require an operator to conduct seismic monitoring of any or all blasts and may specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

Records of blasting operations

The operator shall retain a record of all blasts for at least 3 years. Upon request, copies of these records shall be made available to the Division and to the public for inspection.

Analysis:

No surface blasting will occur as a result of the Whitmore lease. No modification to the current MRP is necessary. This includes modifications to the Preblasting survey, Performance standards, Blasting signs, warnings and access control, Control of adverse effects, and record of blasting operations.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operational Plan – Use of Explosives section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the mining activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The following shall be shown for the proposed permit area:

Affected area maps

The boundaries of all areas proposed to be affected over the estimated total life of all mining activities and reclamation activities, with a description of size, sequence, and timing of phased reclamation activities and treatments. All maps and cross sections used for mining design and mining operations shall clearly show the affected and permit area boundaries in reference to the reclamation work being accomplished.

Mining facilities maps

Location of each facility used in conjunction with mining operations. Such structures and facilities shall include, but not be limited to: buildings, utility corridors, roads, and facilities to be used in mining and reclamation operations or by others within the permit area; each coal storage, cleaning, and loading area; each topsoil, spoil, coal preparation waste, underground development waste, and noncoal waste storage area; each water diversion, collection, conveyance, treatment, storage and discharge facility; each source of waste and each waste disposal facility relating to coal processing or pollution control; each facility to be used to protect and enhance fish and wildlife related environmental values; each explosives storage and handling facility; location of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing water dam and embankment, and disposal areas for underground development waste and excess spoil; and, each plan or profile, at cross sections specified by the Division, of the anticipated surface configuration to be achieved for the affected areas during mining operations.

Mine workings maps

Location and extent of known workings of proposed, active, inactive, or abandoned underground mines, including mine openings to the surface within the proposed permit and adjacent areas. Location and extent of existing or previously surface-mined areas within the proposed permit area.

Monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, subsidence, fish and wildlife, and air quality, as required during mining operations.

Certification Requirements

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified

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registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

Affected Area Maps

The affected area is considered by the Division to be the same as the permit boundary. The permit boundary is shown on several maps including Map 1-1.

Mining Facilities Maps

The surface mine facilities maps will not change as a result of the Whitmore lease.

Mine Workings Maps

Map 5-4A and Map 5-4B show the existing and proposed mine workings for the Whitmore lease and possible additional leases.

Monitoring and Sample Location Maps

No additional exploration drill hole information has been submitted with this application. Additional surface and water ground water monitoring sites have been added to the monitoring plan and are included in Map 7-7 (Operational Monitoring Locations). No other modifications are necessary.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Operational Plan – Map, Plans and Cross Sections of Mining Operations section of the regulations.

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GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Minimum Regulatory Requirements:

Provide a plan for the reclamation of the lands within the proposed permit area, showing how the applicant will comply with the regulatory program and the environmental protection performance standards. The plan shall include, at a minimum, contain the following information for the proposed permit area: a detailed timetable for the completion of each major step in the reclamation plan; a detailed estimate of the cost of the reclamation of the proposed operations required to be covered by a performance bond, with supporting calculations for the estimates; a plan for backfilling, soil stabilization, compacting, and grading, with contour maps or cross sections that show the anticipated final surface configuration of the proposed permit area; a plan for redistribution of topsoil, subsoil, and other material along with a demonstration of the suitability of topsoil substitutes or supplements shall be based upon analysis of the thickness of soil horizons, total depth, texture, percent coarse fragments, pH, and areal extent of the different kinds of soils; other chemical and physical analyses, field-site trials, or greenhouse tests if determined to be necessary or desirable to demonstrate the suitability of the topsoil substitutes or supplements may also be required; a plan for revegetation including, but not limited to, descriptions of the schedule of revegetation, species and amounts per acre of seeds and seedlings to be used, methods to be used in planting and seeding, mulching techniques, irrigation, if appropriate, and pest and disease control measures, if any, measures proposed to be used to determine the success of revegetation, and, a soil testing plan for evaluation of the results of topsoil handling and reclamation procedures related to revegetation; a description of the measures to be used to maximize the use and conservation of the coal resource; a description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of accordingly and a description of the contingency plans which have been developed to preclude sustained combustion of such materials; a description, including appropriate cross sections and maps, of the measures to be used to seal or manage mine openings, and to plug, case, or manage exploration holes, other bore holes, wells, and other openings within the proposed permit area; and, a description of steps to be taken to comply with the requirements of the Clean Air Act, the Clean Water Act, and other applicable air and water quality laws and regulations and health and safety standards.

Analysis:

The applicant has proposed no changes to the postmining land uses, and the proposed mining activity should have no effect on these uses.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Postmining Land Uses section of the regulations.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR 817.97; R645-301-333, -301-342, -301-358.

Minimum Regulatory Requirements:

Where wetlands and habitats of unusually high value for fish and wildlife occur, the operator conducting underground

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mining activities shall provide a description of the measures taken to avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Designs and plans for underground mining activities shall include measures to avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Where fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas shall be selected on the basis of the following criteria:

- 1.) Their proven nutritional value for fish or wildlife.
- 2.) Their use as cover for fish or wildlife.
- 3.) Their ability to support and enhance fish or wildlife habitat after the release of performance bonds. The selected plants shall be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits to fish and wildlife.

Where cropland is to be the postmining land use, and where appropriate for wildlife- and crop-management practices, the operator shall intersperse the fields with trees, hedges, or fence rows throughout the harvested area to break up large blocks of monoculture and to diversify habitat types for birds and other animals.

Where residential, public service, or industrial uses are to be the postmining land use and where consistent with the approved postmining land use, the operator shall intersperse reclaimed lands with greenbelts utilizing species of grass, shrubs, and trees useful as food and cover for wildlife.

Analysis:

The applicant has proposed no additional surface disturbing activities; therefore, no additional measures to protect wildlife and improvement to wildlife habitat during reclamation are needed.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Protection of Fish, Wildlife, and Related Environmental Values section of the regulations.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Minimum Regulatory Requirements:

Note :The following requirements have been suspended insofar as they authorize any variance from approximate original contour for surface coal mining operations in any area which is not a steep slope area.

Criteria for permits incorporating variances from approximate original contour restoration requirements.

The Division may issue a permit for nonmountaintop removal mining which includes a variance from the backfilling and grading requirements to restore the disturbed areas to their approximate original contour. The permit may contain such a variance only if the Division finds, in writing, that the applicant has demonstrated, on the basis of a complete application, that the following requirements are met:

- 1.) After reclamation, the lands to be affected by the variance within the permit area will be suitable for an industrial, commercial, residential, or public postmining land use (including recreational facilities).
- 2.) The criteria for the proposed post mining land use will be met.
- 3.) The watershed of lands within the proposed permit and adjacent areas will be improved by the operations when compared with the condition of the watershed before mining or with its condition if the approximate original

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contour were to be restored. The watershed will be deemed improved only if: the amount of total suspended solids or other pollutants discharged to ground or surface water from the permit area will be reduced, so as to improve the public or private uses or the ecology of such water, or flood hazards within the watershed containing the permit area will be reduced by reduction of the peak flow discharge from precipitation events or thaws; the total volume of flow from the proposed permit area, during every season of the year, will not vary in a way that adversely affects the ecology of any surface water or any existing or planned use of surface or ground water; and, the appropriate State environmental agency approves the plan.

- 4.) The owner of the surface of the lands within the permit area has knowingly requested, in writing, as part of the application, that a variance be granted. The request shall be made separately from any surface owner consent given for right-of-entry and shall show an understanding that the variance could not be granted without the surface owner's request.

If a variance is granted, the requirements of the post mining land use criteria shall be included as a specific condition of the permit, and, the permit shall be specifically marked as containing a variance from approximate original contour.

A permit incorporating a variance shall be reviewed by the Division at least every 30 months following the issuance of the permit to evaluate the progress and development of the surface coal mining and reclamation operations to establish that the operator is proceeding in accordance with the terms of the variance. If the permittee demonstrates to the Division that the operations have been, and continue to be, conducted in compliance with the terms and conditions of the permit, the review specified need not be held. The terms and conditions of a permit incorporating a variance may be modified at any time by the Division, if it determines that more stringent measures are necessary to ensure that the operations involved are conducted in compliance with the requirements of the regulatory program. The Division may grant variances only if it has promulgated specific rules to govern the granting of variances in accordance with the provisions of this section and any necessary, more stringent requirements.

Analysis:

Since no additional surface area will be disturbed in the Whitmore lease, no modification to the currently approved MRP is necessary.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Approximate Original Contour section of the regulations.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Minimum Regulatory Requirements:

General

Disturbed areas shall be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions; achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use.

The postmining slope may vary from the approximate original contour when approval is obtained from the Division for a variance from approximate original contour requirements, or when incomplete elimination of highwalls in previously mined areas is allowed under the regulatory requirements. Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

If it is determined by the Division that disturbance of the existing spoil or underground development waste would increase environmental harm or adversely affect the health and safety of the public, the Division may allow the existing spoil or underground development waste pile to remain in place. Accordingly, regrading of settled and revegetated fills to achieve approximate original

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contour at the conclusion of underground mining activities shall not be required if: the settled and revegetated fills are composed of spoil or nonacid- or nontoxic-forming underground development waste; the spoil or underground development waste is not located so as to be detrimental to the environment, to the health and safety of the public, or to the approved postmining land use; stability of the spoil or underground development waste must be demonstrated through standard geotechnical analysis to be consistent with backfilling and grading requirements for material on the solid bench (1.3 static safety factor) or excess spoil requirements for material not placed on a solid bench (1.5 static safety factor); and, the surface of the spoil or underground development waste shall be vegetated in accordance with the revegetation standards for success, and surface runoff shall be controlled in accordance with the regulatory requirements for diversions.

Spoil shall be returned to the mined-out surface area. Spoil and waste materials shall be compacted where advisable to ensure stability or to prevent leaching of toxic materials. Spoil may be placed on the area outside the mined-out surface area in nonsteep slope areas to restore the approximate original contour by blending the spoil into the surrounding terrain if the following requirements are met: all vegetative and organic materials shall be removed from the area; the topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with regulatory requirements; the spoil shall be backfilled and graded on the area in accordance with the general requirements for backfilling and grading.

Disposal of coal processing waste and underground development waste in the mined-out surface area shall be in accordance with the requirements for the disposal of spoil and waste materials except that a long-term static safety factor of 1.3 shall be achieved.

Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining shall be adequately covered with nontoxic and noncombustible materials, or treated, to control the impact on surface and ground water, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

Cut-and-fill terraces may be allowed by the Division where: needed to conserve soil moisture, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved postmining land use; or, specialized grading, foundation conditions, or roads are required for the approved postmining land use, in which case the final grading may include a terrace of adequate width to ensure the safety, stability, and erosion control necessary to implement the postmining land-use plan.

Preparation of final-graded surfaces shall be conducted in a manner that minimizes erosion and provides a surface for replacement of topsoil that will minimize slippage.

Previously mined areas

Remining operations on previously mined areas that contain a preexisting highwall shall comply with all other reclamation requirements except as provided herein. The requirement that elimination of highwalls shall not apply to remining operations where the volume of all reasonably available spoil is demonstrated in writing to the Division to be insufficient to completely backfill the reaffected or enlarged highwall. The highwall shall be eliminated to the maximum extent technically practical in accordance with the following criteria:

- 1.) All spoil generated by the remining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remining operation shall be included within the permit area.
- 2.) The backfill shall be graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability.
- 3.) Any highwall remnant shall be stable and not pose a hazard to the public health and safety or to the environment. The operator shall demonstrate, to the satisfaction of the Division, that the highwall remnant is stable.
- 4.) Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

Backfilling and grading on steep slopes

Underground mining activities on steep slopes shall be conducted so as to meet other applicable regulatory requirements and the requirements of this section. The following materials shall not be placed on the downslope: spoil; waste materials of any type; debris, including that from clearing and grubbing; abandoned or disabled equipment; land above the highwall shall not be disturbed unless the Division finds that this disturbance will facilitate compliance with the environmental protection standards and the disturbance is limited to that necessary to facilitate compliance; and, woody materials shall not be buried in the backfilled area unless the Division determines that the proposed method for placing woody material within the backfill will not deteriorate the stable condition of the backfilled area.

Special provisions for steep slope mining

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No permit shall be issued for any operations covered by steep slope mining, unless the Division finds, in writing, that in addition to meeting all other regulatory requirements, the operation will be conducted in accordance with the requirements for backfilling and grading on steep slopes. Any application for a permit for surface coal mining and reclamation operations covered by steep slope mining shall contain sufficient information to establish that the operations will be conducted in accordance with the requirements for backfilling and grading on steep slopes.

This section applies to any person who conducts or intends to conduct steep slope surface coal mining and reclamation operations, except: where an operator proposes to conduct surface coal mining and reclamation operations on flat or gently rolling terrain, leaving a plain or predominantly flat area, but on which an occasional steep slope is encountered as the mining operation proceeds; where a person obtains a permit under the provisions for mountaintop removal mining; or, to the extent that a person obtains a permit incorporating a variance from approximate original contour restoration requirements.

Analysis:

Since no additional surface area will be disturbed in the Whitmore lease, no modification to the currently approved MRP is necessary. This includes no changes to Previously mined areas, Steep slopes, and Special Provisions for Steep slope mining.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Backfilling and Grading section of the regulations.

MINE OPENINGS

Regulatory Reference: 30 CFR 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Minimum Regulatory Requirements:

Each exploration hole, other drillhole or borehole, shaft, well, or other exposed underground opening shall be cased, lined, or otherwise managed as approved by the Division to prevent acid or other toxic drainage from entering ground and surface waters, to minimize disturbance to the prevailing hydrologic balance and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit area and adjacent area. Each exploration hole, drill hole or borehole or well that is uncovered or exposed by mining activities within the permit area shall be permanently closed, unless approved for water monitoring or otherwise managed in a manner approved by the Division. Use of a drilled hole or monitoring well as a water well must meet the provisions required to protect the hydrologic balance. This section does not apply to holes drilled and used for blasting, in the area affected by surface operations.

Each mine entry which is temporarily inactive, but has a further projected useful service under the approved permit application, shall be protected by barricades or other covering devices, fenced, and posted with signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices shall be periodically inspected and maintained in good operating condition by the person who conducts the underground mining activities.

Each exploration hole, other drill hole or borehole, shaft, well, and other exposed underground opening which has been identified in the approved permit application for use to return underground development waste, coal processing waste or water to underground workings, or to be used to monitor ground water conditions, shall be temporarily sealed until actual use.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well, each shaft, drift, adit, tunnel, exploratory hole, entry way or other opening to the surface from underground shall be capped, sealed, backfilled, or otherwise properly managed, as required by the Division and consistent with the requirements of 30 CFR Section 75.1711. Permanent closure measures shall be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

Analysis:

Since no additional mine openings will be created with the addition of the Whitmore lease, no modification to the current MRP is necessary.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Backfilling and Grading section of the regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR 817.22; R645-301-240.

Minimum Regulatory Requirements:

Redistribution

Topsoil materials shall be redistributed in a manner that: achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems; prevents excess compaction of the materials; and, protects the materials from wind and water erosion before and after seeding and planting.

Before redistribution of the material, the regarded land shall be treated if necessary to reduce potential slippage of the redistribution material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.

The Division may choose not to require the redistribution of topsoil or topsoil substitutes on the approved postmining embankments of permanent impoundments or of roads if it determines that placement of topsoil or topsoil substitutes on such embankments is inconsistent with the requirement to use the best technology currently available to prevent sedimentation, and, such embankments will be otherwise stabilized.

Nutrients and soil amendments shall be applied to the initially redistributed material when necessary to establish the vegetative cover.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, removed and segregated, stockpiled, be redistributed as subsoil in accordance with the requirements of the above if it finds that such subsoil layers are necessary to comply with the revegetation requirements.

Analysis:

Redistribution

Since no additional surface area will be disturbed in the Whitmore lease, no modification to the Redistribution of Topsoil and Subsoil section of the currently approved MRP is necessary.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Topsoil and Subsoil section of the regulations.

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ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Minimum Regulatory Requirements:

Reclamation

A road not to be retained under an approved postmining land use shall be reclaimed in accordance with the approved reclamation plan as soon as practicable after it is no longer needed for mining and reclamation operations. This reclamation shall include: closing the road to traffic; removing all bridges and culverts unless approved as part of the postmining land use; removing or otherwise disposing of road-surfacing materials that are incompatible with the postmining land use and revegetation requirements; reshaping cut and fill slopes as necessary to be compatible with the postmining land use and to complement the natural drainage pattern of the surrounding terrain; protecting the natural drainage patterns by installing dikes or cross drains as necessary to control surface runoff and erosion; and, scarifying or ripping the roadbed, replacing topsoil or substitute material and revegetating disturbed surfaces.

Retention

A road to be retained for an approved postmining land use shall be classified as a primary road and designed constructed and maintained in accordance with the requirements for primary roads and in consideration of the approved postmining land use.

Analysis:

No additional roads will be built or changes to their reclamation plans will occur because of the Whitmore lease. No modifications to the current MRP are necessary.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Road Systems and Other Transportation Facilities section of the regulations.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Minimum Regulatory Requirements:

Hydrologic reclamation plan

The application shall include a plan, with maps and descriptions, indicating how the relevant regulatory requirements will be met. The plan shall be specific to the local hydrologic conditions. It shall contain the steps to be taken during mining and reclamation through bond release to minimize disturbance to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; and to meet applicable Federal and State water quality laws and regulations. The plan shall include the measures to be taken to: avoid acid or toxic drainage; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; provide water treatment facilities when needed; and control drainage. The plan shall specifically address any potential adverse hydrologic consequences identified in the PHC determination and shall include preventive and remedial measures.

Each application shall contain descriptions, including maps and cross sections, of stream channel diversions and other

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diversions to be constructed within the proposed permit area to achieve compliance with the performance standards for those structures.

Postmining rehabilitation of sedimentation ponds, diversions, impoundments, and treatment facilities

Before abandoning a permit area or seeking bond release, the operator shall ensure that all temporary structures are removed and reclaimed, and that all permanent sedimentation ponds, diversions, impoundments, and treatment facilities meet the requirements of this Chapter for permanent structures, have been maintained properly and meet the requirements of the approved reclamation plan for permanent structures and impoundments. The operator shall renovate such structures if necessary to meet the requirements of this Chapter and to conform to the approved reclamation plan.

Analysis:

General

No additional surface facilities are being constructed, and no modification to the disturbed area impacts is anticipated. No modifications are necessary to the Reclamation Plan – Hydrologic Information based on the current proposal of adding Federal Lease UTU-78562. Portions of the Hydrologic Reclamation Plan that do not require revision include; Acid and toxic-forming materials, Transfer of wells, Discharges into an underground mine, Gravity discharges, Water quality standards and effluent limitations, Diversions, Sediment control measures, Siltation structures, Sedimentation ponds, Other treatment facilities, Exemptions for siltation structures, Discharge structures, Impoundments, Ponds, banks, dams and embankments, and casing and sealing of wells.

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Ground-Water Monitoring

The only modification of the Ground-water monitoring plan includes the monitoring of Spring S-80, located at Hanging Rock Spring, through reclamation and bond release.

Surface-Water Monitoring

The only modification of the Surface-water monitoring plan includes the monitoring of Stream sites ST-9 and ST-10, located on Grassy Trail Creek, through reclamation and bond release.

Stream Buffer Zones

The Applicant makes a written commitment in Section R645-301-541 to reclaim any impacts from mining in accordance with the approved permit. Impacts will be mitigated as soon as possible upon their discovery.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Reclamation Plan – Hydrologic Information section of the regulations.

REVEGETATION

Regulatory Reference: 30 CFR 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Minimum Regulatory Requirements:

Revegetation: General requirements

The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is: diverse, effective, and permanent; comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division; at least equal in extent of cover to the natural vegetation of the area; and, capable of stabilizing the soil surface from erosion.

The reestablished plant species shall: be compatible with the approved postmining land use; have the same seasonal characteristics of growth as the original vegetation; be capable of self-regeneration and plant succession; be compatible with the plant and animal species of the area; and, meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

The Division may grant exception to these requirements when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

When the Division approves a cropland postmining land use, the Division may grant exceptions to the requirements related to the original and native species of the area. Areas identified as prime farmlands must also meet those specific requirements as specified under that section.

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Revegetation: Timing

Disturbed areas shall be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for favorable planting is that planting time generally accepted locally for the type of plant materials selected.

Revegetation: Mulching and other soil stabilizing practices

Suitable mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The Division may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

Revegetation: Standards for success

Success of revegetation shall be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the cover occurring in natural vegetation of the area, and the general requirements for Revegetation. Standards for success and statistically valid sampling techniques for measuring success shall be selected by the Division and included in an approved regulatory program.

Standards for success shall include criteria representative of unmined lands in the area being reclaimed to evaluate the appropriate vegetation parameters of ground cover, production, or stocking. Ground cover, production, or stocking shall be considered equal to the approved success standard when it is not less than 90 percent of the success standard. The sampling techniques for measuring success shall use a 90-percent statistical confidence interval (i.e., a one-sided test with a 0.10 alpha error).

Standards for success shall be applied in accordance with the approved postmining land use and, at a minimum, the following conditions:

- 1.) For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.
- 2.) For areas developed for use as cropland, crop production on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.
- 3.) For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation shall be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows: minimum stocking and planting arrangements shall be specified by the Division on the basis of local and regional conditions and after consultation with and approval by the State agencies responsible for the administration of forestry and wildlife programs. Consultation and approval may occur on either a programwide or a permit-specific basis; trees and shrubs that will be used in determining the success of stocking and the adequacy of the plant arrangement shall have utility for the approved postmining land use. Trees and shrubs counted in determining such success shall be healthy and have been in place for not less than two growing seasons. At the time of bond release, at least 80 percent of the trees and shrubs used to determine such success shall have been in place for 60 percent of the applicable minimum period of responsibility; and, vegetative ground cover shall not be less than that required to achieve the approved postmining land use.

For areas to be developed for industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

For areas previously disturbed by mining that were not reclaimed to the requirements of the performance standards and that are remined or otherwise redisturbed by surface coal mining operations, as a minimum, the vegetative ground cover shall be not less than the ground cover existing before redisturbance and shall be adequate to control erosion.

The period of extended responsibility for successful revegetation shall begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the Division.

In areas of more than 26.0 inches of annual average precipitation, the period of responsibility shall continue for a period of not less than five full years. Vegetation parameters identified for grazing land or pasture land and cropland shall equal or exceed the approved success standard during the growing seasons of any two years of the responsibility period, except the first year. Areas approved for the other uses shall equal or exceed the applicable success standard during the growing season of the last year of the responsibility period.

In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not

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less than 10 full years. Vegetation parameters shall equal or exceed the approved success standard for at least the last 2 consecutive years of the responsibility period.

The Division may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, provided it obtains prior approval from the Director as a State Program Amendment that the practices are normal husbandry practices, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal husbandry practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding, and transplanting specifically necessitated by such actions.

Analysis:

The Applicant has proposed no changes in the revegetation plan due to the addition of Federal Lease UTU-78562. No new surface disturbance is anticipated which would require modification to the currently approved plan.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan - Revegetation section of the regulations.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR 817.95; R645-301-244.

Minimum Regulatory Requirements:

All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion. Rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved postmining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

Analysis:

There are no additional surface disturbances associated with the current proposal that would require a modification to the currently approved MRP.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan - Stabilization of Surface Areas section of the regulations.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR 817.131, 817.132; R645-301-515, -301-541.

Minimum Regulatory Requirements:

Each person who conducts mining activities shall effectively support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit. Temporary abandonment shall not relieve a person of his or her obligation to comply with any provisions of the approved permit.

Before temporary cessation of mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, each person who conducts underground mining activities shall submit to the Division a notice of intention to cease or abandon operations. This notice shall include a statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the permit area prior to cessation or abandonment, the extent and kind of surface area reclamation which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures, and water-treatment activities that will continue during the temporary cessation.

The person who conducts underground mining activities shall close or backfill or otherwise permanently reclaim all affected areas, in accordance with this Chapter and according to the permit approved by the Division.

All surface equipment, structures, or other facilities not required for continued underground mining activities and monitoring, unless approved as suitable for the postmining land use or environmental monitoring, shall be removed and the affected lands reclaimed.

Analysis:

No modification to the Cessation of Operations section of the current MRP is necessary due to the addition of Federal Lease UTU-78562.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Cessation of Operations section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the reclamation activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The permit application must include as part of the reclamation plan information, the following maps, plans and cross sections:

Affected area boundary maps

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The boundaries of all areas proposed to be affected over the estimated total life of all mining activities and reclamation activities, with a description of size, sequence, and timing of phased reclamation activities and treatments. All maps and cross sections used for reclamation design purposes shall clearly show the affected and permit area boundaries in reference to the reclamation work being accomplished.

Bonded area map

The permittee shall identify the initial and successive areas or increments for bonding on the permit application map and shall specify the bond amount to be provided for each area or increment. The bond or bonds shall cover the entire permit area, or an identified increment of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations during the initial term of the permit. As surface coal mining and reclamation operations on succeeding increments are initiated and conducted within the permit area, the permittee shall file with the Division an additional bond or bonds to cover such increments. Independent increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the Division become necessary.

Reclamation backfilling and grading maps

Contour maps and cross sections to adequately show detail and design for backfilling and grading operations during reclamation. Where possible, cross sections shall include profiles of the pre-mining, operations, and post-reclamation topography. Contour maps shall be at a suitable scale and contour interval so as to adequately detail the final surface configuration. When used in the formulation of mass balance calculations, cross sections shall be at adequate scale and intervals to support the mass balance calculations. Mass balance calculations derived from contour information must demonstrate that map scale and contour accuracy are adequate to support the methods used in such earthwork calculations. Detailed cross sections shall be provided when required to accurately depict reclamation designs which include, but are not limited to: terracing and benching, retained roads, highwall remnants, slopes requiring geotechnical analysis, and embankments of permanent impoundments.

Reclamation facilities maps

Location of each facility that will remain on the proposed permit area as a permanent feature, after the completion of underground mining activities. Location and final disposition of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing water dam and embankment, disposal areas for underground development waste and excess spoil, and water treatment and air pollution control facilities within the proposed permit area to be used in conjunction with phased reclamation activities or to remain as part of reclamation.

Final surface configuration maps

Sufficient slope measurements to adequately delineate the final surface configuration of the area affected by surface operations and facilities, measured and recorded according to the following: each measurement shall consist of an angle of inclination along the prevailing slope extending 100 linear feet above and below or beyond the coal outcrop or the area disturbed or, where this is impractical, at locations specified by the Division; where the area has been previously mined, the measurements shall extend at least 100 feet beyond the limits of mining disturbances, or any other distance determined by the Division to be representative of the post-reclamation configuration of the land; and, slope measurements shall take into account variations in slope, to provide accurate representation of the range of slopes and reflect geomorphic differences of the area disturbed through reclamation activities.

Reclamation monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, subsidence, fish and wildlife, and air quality, if required, to demonstrate reclamation success.

Reclamation surface and subsurface manmade features maps

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current or proposed use of the buildings at the time of final reclamation. The location of surface and subsurface manmade features within, passing through, or passing over the proposed permit area, including, but not limited to, major electric transmission lines, pipelines, fences, and agricultural drainage tile fields. Each public road located in or within 100 feet of the proposed permit area and all roads within the permit area which are to be left as part of the post-mining land use. Buildings, utility corridors, and facilities to be used in conjunction with reclamation or to remain for final reclamation.

Reclamation treatments maps

The location and boundaries of any proposed areas for reclamation treatments including but not limited to: location, extent and depth of materials used for resoiling; location, extent and types of treatments for revegetation including soil preparation, soil amendments, mulching, seeding, variations in seed mixtures, and other revegetation treatments. Each water diversion, collection,

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conveyance, treatment, storage and discharge facility to be used during reclamation. Each facility to be used to protect and enhance fish and wildlife related environmental values. Other treatments or applications which are specifically designed or required as part of phased or final reclamation activity.

Certification Requirements.

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

No additional roads will be built or changes to the reclamation plan will occur because of the addition of Federal Lease UTU-78562. This includes no Reclamation changes to the following maps; Affected area boundary maps, Bonded area map, Reclamation backfilling and grading maps, Reclamation facilities map, Final surface configuration map, Reclamation monitoring and sampling location map, Reclamation surface and subsurface manmade features map, and Reclamation treatments map.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Maps, Plans, and Cross Sections of Reclamation Operations section of the regulations.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR 800; R645-301-800, et seq.

Minimum Regulatory Requirements:

General

After a permit application has been approved, but before a permit is issued, the applicant shall file with the Division, on a form prescribed and furnished by the Division, a bond or bonds for performance made payable to the Division and conditioned upon the faithful performance of all the requirements of the Act, the regulatory program, the permit, and the reclamation plan.

The bond or bonds shall cover the entire permit area, or an identified increment of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations during the initial term of the permit. As surface

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coal mining and reclamation operations on succeeding increments are initiated and conducted within the permit area, the permittee shall file with the Division an additional bond or bonds to cover such increments.

The operator shall identify the initial and successive areas or increments for bonding on the permit application map and shall specify the bond amount to be provided for each area or increment. Independent increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the Division become necessary.

An operator shall not disturb any surface areas, succeeding increments, or extend any underground shafts, tunnels, or operations prior to acceptance by the Division of the required performance bond.

The applicant shall file, with the approval of the Division, a bond or bonds under one of the following schemes to cover the bond amounts for the permit area as determined: a performance bond or bonds for the entire permit area; a cumulative bond schedule and the performance bond required for full reclamation of the initial area to be disturbed; or, an incremental-bond schedule and the performance bond required for the first increment in the schedule.

Form of bond

The Division shall prescribe the form of the performance bond. The Division may allow for: a surety bond; a collateral bond; a self-bond; or a combination of any of these bonding methods.

Performance bond liability shall be for the duration of the surface coal mining and reclamation operation and for a period which is coincident with the operator's period of extended responsibility for successful revegetation or until achievement of the reclamation requirements of the Act, regulatory programs, and permit, whichever is later.

With the approval of the Division, a bond may be posted and approved to guarantee specific phases of reclamation within the permit area provided the sum of phase bonds posted equals or exceeds the total amount required. The scope of work to be guaranteed and the liability assumed under each phase bond shall be specified in detail.

Isolated and clearly defined portions of the permit area requiring extended liability may be separated from the original area and bonded separately with the approval of the Division. Such areas shall be limited in extent and not constitute a scattered, intermittent, or checkerboard pattern of failure. Access to the separated areas for remedial work may be included in the area under extended liability if deemed necessary by the Division.

The bond liability of the permittee shall include only those actions which he or she is obligated to take under the permit, including completion of the reclamation plan, so that the land will be capable of supporting the postmining land use approved. Implementation of an alternative postmining land use which is beyond the control of the permittee, need not be covered by the bond. Bond liability for prime farmland shall be specific to include productivity requirements.

Determination of bond amount

The amount of the bond required for each bonded area shall: be determined by the Division; depend upon the requirements of the approved permit and reclamation plan; reflect the probable difficulty of reclamation, giving consideration to such factors as topography, geology, hydrology, and revegetation potential; and, be based on, but not limited to, the estimated cost submitted by the permit applicant.

The amount of the bond shall be sufficient to assure the completion of the reclamation plan if the work has to be performed by the Division in the event of forfeiture, and in no case shall the total bond initially posted for the entire area under 1 permit be less than \$10,000.

An operator's financial responsibility for repairing material damage resulting from subsidence may be satisfied by the liability insurance policy required in this section.

Terms and conditions for liability insurance

The Division shall require the applicant to submit as part of its permit application a certificate issued by an insurance company authorized to do business in the United States certifying that the applicant has a public liability insurance policy in force for the surface coal mining and reclamation operations for which the permit is sought. Such policy shall provide for personal injury and property damage protection in an amount adequate to compensate any persons injured or property damaged as a result of the surface coal mining and reclamation operations, including the use of explosives, and who are entitled to compensation under the applicable provisions of State law. Minimum insurance coverage for bodily injury and property damage shall be \$300,000 for each occurrence and \$500,000 aggregate.

The policy shall be maintained in full force during the life of the permit or any renewal thereof and the liability period necessary to complete all reclamation operations under this Chapter.

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The policy shall include a rider requiring that the insurer notify the Division whenever substantive changes are made in the policy including any termination or failure to renew.

The Division may accept from the applicant, in lieu of a certificate for a public liability insurance policy, satisfactory evidence from the applicant that it satisfies applicable State self-insurance requirements approved as part of the regulatory program and the requirements of this section.

Analysis:

Determination of Bond Amount

Since no new surface facilities will be built as a result of the addition of the Whitmore lease the bond amount will not change for the Whitmore lease addition.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Bonding and Insurance Requirements section of the regulations.

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REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

EXPERIMENTAL PRACTICES MINING

Regulatory Reference: 30 CFR 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

Minimum Regulatory Requirements

No application for an experimental practice under this section shall be approved until the Division first finds in writing and the Director then concurs that:

- 1.) The experimental practice encourages advances in mining and reclamation technology or allows a postmining land use for industrial, commercial, residential, or public use (including recreational facilities) on an experimental basis;
- 2.) The experimental practice is potentially more, or at least as, environmentally protective, during and after mining operations, as would otherwise be required by the regulatory standards;
- 3.) The mining operations approved for a particular land use or other purpose are not larger or more numerous than necessary to determine the effectiveness and economic feasibility of the experimental practice; and
- 4.) The experimental practice does not reduce the protection afforded public health and safety below that provided by the regulatory standards.

Experimental practices granting variances from the special environmental protection performance standards applicable to prime farmland shall be approved only after consultation with the U.S. Department of Agriculture, Soil Conservation Service.

Each person undertaking an experimental practice shall conduct the periodic monitoring, recording, and reporting program set forth in the application, and shall satisfy such additional requirements as the Division or the Director may impose to ensure protection of the public health and safety and the environment.

Each experimental practice shall be reviewed by the Division at a frequency set forth in the approved permit, but no less frequently than every 2 1/2 years. After review, the Division may require such reasonable modifications of the experimental practice as are necessary to ensure that the activities fully protect the environment and the public health and safety. Copies of the decision of the Division shall be sent to the permittee and shall be subject to the provisions for administrative and judicial review.

Revisions or modifications to an experimental practice shall be processed in accordance with the regulatory requirements for revisions or modifications and approved by the Division. Any revisions which propose significant alterations in the experimental practice shall, at a minimum, be subject to notice, hearing, and public participation and concurrence by the Director. Revisions that do not propose significant alterations in the experimental practice shall not require concurrence by the Director.

Analysis:

The applicant has an approved experimental practice, but the proposal should have no effect on this portion of the operation.

Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Experimental Practices Mining section of the regulations

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-300 et seq.

Minimum Regulatory Requirements:

All permit applications, whether or not prime farmland is present, shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists. The Division in consultation with the U.S. Soil Conservation Service shall determine the nature and extent of the required reconnaissance inspection.

If the reconnaissance inspection indicates that land within the proposed permit area may be prime farmland historically used for croplands, the applicant shall determine if a soil survey exists for those lands and whether soil mapping units in the permit area have been designated as prime farmland. If no soil survey exists, the applicant shall have a soil survey made of the lands within the permit area which the reconnaissance inspection indicates could be prime farmland. Soil surveys of the detail used by the U.S. Soil Conservation Service for operational conservation planning shall be used to identify and locate prime farmland soils.

If the soil survey indicates that prime farmland soils are present within the proposed permit area, the following shall apply:

Prime Farmland Application contents.

All permit applications for areas in which prime farmland has been identified within the proposed permit area shall include the following:

- 1.) A soil survey of the permit area according to the standards of the National Cooperative Soil Survey and in accordance with the procedures set forth in U.S. Department of Agriculture Handbook 436 "Soil Taxonomy" (U.S. Soil Conservation Service, 1975) as amended on March 22, 1982, and October 5, 1982, and 18, "Soil Survey Manual" (U.S. Soil Conservation Service, 1951), as amended on December 18, 1979, May 7, 1980, May 9, 1980, September 11, 1980, June 9, 1981, June 29, 1981, and November 16, 1982. The U.S. Soil Conservation Service establishes the standards of the National Cooperative Soil Survey and maintains a National Soils Handbook which gives current acceptable procedures for conducting soil surveys. This National Soils Handbook is available for review at area and State SCS offices.
 - (i) U.S. Department of Agriculture Handbooks 436 and 18 are incorporated by reference as they exist on the date of adoption of this section. Notices of changes made to these publications will be periodically published by OSM in the Federal Register. The handbooks are on file and available for inspection at the OSM Central Office, U.S. Department of the Interior, 1951 Constitution Avenue, NW., Washington, D.C., at each OSM Technical Center and Field Office, and at the central office of the applicable State Division, if any. Copies of these documents are also available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock Nos. 001-000-02597-0 and 001-000-00688-6, respectively. In addition, these documents are available for inspection at the national, State, and area offices of the Soil Conservation Service, U.S. Department of Agriculture, and that the Federal Register library, 1100 L Street, NW., Washington, D.C. Incorporation by reference provisions were approved by the Director of the Federal Register on June 29, 1981.
 - (ii) The soil survey shall include a description of soil mapping units and a representative soil profile as determined by the U.S. Soil Conservation Service, including, but not limited to, soil-horizon depths, pH, and the range of soil densities for each prime farmland soil unit within the permit area. Other representative soil-profile descriptions from the locality, prepared according to the standards of the National Cooperative Soil Survey, may be used if their use is approved by the State Conservationist, U.S. Soil Conservation Service. The Division may request the operator to provide information on other physical and chemical soil properties as needed to make a determination that the operator has the technological capability to restore the prime farmland within the permit area to the soil-reconstruction standards of this section.
- 2.) A plan for soil reconstruction, replacement, and stabilization for the purpose of establishing the technological capability of the mine operator to comply with the requirements of this section.
- 3.) Scientific data, such as agricultural-school studies, for areas with comparable soils, climate, and management that demonstrate that the proposed method of reclamation, including the use of soil mixtures or substitutes, if any, will achieve, within a reasonable time, levels of yield equivalent to, or higher than, those of nonmined prime farmland in the surrounding area.
- 4.) The productivity prior to mining, including the average yield of food, fiber, forage, or wood products obtained under a high level of management.

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Consultation with Secretary of Agriculture.

The Secretary of Agriculture has responsibilities with respect to prime farmland soils and has assigned the prime farmland responsibilities arising under the Act to the Chief of the U.S. Soil Conservation Service. The U.S. Soil Conservation Service shall carry out consultation and review through the State Conservationist located in each State.

The State Conservationist shall provide to the Division a list of prime farmland soils, their location, physical and chemical characteristics, crop yields, and associated data necessary to support adequate prime farmland soil descriptions. The State Conservationist shall assist the Division in describing the nature and extent of the reconnaissance inspection required in this section.

Before any permit is used for areas that include prime farmland, the Division shall consult with the State Conservationist. The State Conservationist shall provide for the review of, and comment on, the proposed method of soil reconstruction in the plan submitted. If the State Conservationist considers those methods to be inadequate, he or she shall suggest revisions to the Division which result in more complete and adequate reconstruction.

Issuance of permit.

A permit for the mining and reclamation of prime farmland may be granted by the Division, if it first finds, in writing, upon the basis of a complete application, that:

- 1.) The approved proposed postmining land use of these prime farmlands will be cropland;
- 2.) The permit incorporates as specific conditions the contents of the plan after consideration of any revisions to that plan suggested by the State Conservationist;
- 3.) The applicant has the technological capability to restore the prime farmland, within a reasonable time, to equivalent or higher levels of yield as nonmined prime farmland in the surrounding area under equivalent levels of management; and
- 4.) The proposed operations will be conducted in compliance with the requirements of this section and other environmental protection performance and reclamation standards for mining and reclamation of prime farmland of the regulatory program.
- 5.) The aggregate total prime farmland acreage shall not be decreased from that which existed prior to mining. Water bodies, if any, to be constructed during mining and reclamation operations must be located within the post-reclamation non-prime farmland portions of the permit area. The creation of any such water bodies must be approved by the Division and the consent of all affected property owners within the permit area must be obtained.

Soil removal and stockpiling

Prime farmland soils shall be removed from the areas to be disturbed before drilling, blasting, or mining. The minimum depth of soil and soil materials to be removed and stored for use in the reconstruction of prime farmland shall be sufficient to meet the requirements specified for soil replacement. Soil removal and stockpiling operations on prime farmland shall be conducted to:

- 1.) Separately remove the topsoil, or remove other suitable soil materials where such other soil materials will create a final soil having a greater productive capacity than that which exist prior to mining. If not utilized immediately, this material shall be placed in stockpiles separate from the spoil and all other excavated materials; and
- 2.) Separately remove the B or C soil horizon or other suitable soil material to provide the thickness of suitable soil required, except as approved by the Division where the B or C soil horizons would not otherwise be removed and where soil capabilities can be retained. If not utilized immediately, each horizon or other material shall be stockpiled separately from the spoil and all other excavated materials. Where combinations of such soil materials created by mixing have been shown to be equally or more favorable for plant growth than the B horizon, separate handling is not necessary.

Stockpiles shall be placed within the permit area where they will not be disturbed or be subject to excessive erosion. If left in place for more than 30 days, stockpiles shall meet the requirements subject to stockpiling and storage of topsoil and subsoil materials.

Soil replacement

Soil reconstruction specifications established by the U.S. Soil Conservation Service shall be based upon the standards of the National Cooperative Soil Survey and shall include, as a minimum, physical and chemical characteristics of reconstructed soils and soil descriptions containing soil-horizon depths, soil densities, soil pH, and other specifications such that reconstructed soils will have the capability of achieving levels of yield equal to, or higher than, those of nonmined prime farmland in the surrounding area.

The minimum depth of soil and substitute soil material to be reconstructed shall be 48 inches, or a lesser depth equal to

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the depth to a subsurface horizon in the natural soil that inhibits or prevents root penetration, or a greater depth if determined necessary to restore the original soil productive capacity. Soil horizons shall be considered as inhibiting or preventing root penetration if their physical or chemical properties or water-supplying capacities cause them to restrict or prevent penetration by roots of plants common to the vicinity of the permit area and if these properties or capacities have little or no beneficial effect on soil productive capacity.

The operator shall replace and regrade the soil horizons or other root-zone material with proper compaction and uniform depth. The operator shall replace the B horizon, C horizon, or other suitable material specified to the thickness needed to meet the requirements of this section. In those areas where the B or C horizons were not removed but may have been compacted or otherwise damaged during the mining operation, the operator shall engage in deep tilling or other appropriate means to restore pre-mining capabilities.

The operator shall replace the topsoil or other suitable soil materials specified as the final surface soil layer. This surface soil layer shall equal or exceed the thickness of the original surface soil layer, as determined by the soil survey.

Revegetation and restoration of soil productivity

Following prime farmland soil replacement, the soil surface shall be stabilized with a vegetative cover or other means that effectively controls soil loss by wind and water erosion.

Prime farmland soil productivity shall be restored in accordance with the following provisions:

- 1.) Measurement of soil productivity shall be initiated within 10 years after completion of soil replacement.
- 2.) Soil productivity shall be measured on a representative sample or on all of the mined and reclaimed prime farmland area using the reference crop determined under this section. A statistically valid sampling technique at a 90-percent or greater statistical confidence level shall be used as approved by the Division in consultation with the U.S. Soil Conservation Service.
- 3.) The measurement period for determining average annual crop production (yield) shall be a minimum of 3 crop years prior to release of the operator's performance bond.
- 4.) The level of management applied during the measurement period shall be the same as the level of management used on nonmined prime farmland in the surrounding area.
- 5.) Restoration of soil productivity shall be considered achieved when the average yield during the measurement period equals or exceeds the average yield of the reference crop established for the same period for nonmined soils of the same or similar texture or slope phase of the soil series in the surrounding area under equivalent management practices.
- 6.) The reference crop on which restoration of soil productivity is proven shall be selected from the crops most commonly produced on the surrounding prime farmland. Where row crops are the dominant crops grown on prime farmland in the area, the row crop requiring the great rooting depth shall be chosen as one of the reference crops.
- 7.) Reference crop yields for a given crop season are to be determined from the current yield records of representative local farms in the surrounding area, with concurrence by the U.S. Soil Conservation Service, or, the average county yields recognized by the U.S. Department of Agriculture, which have been adjusted by the U.S. Soil Conservation Service for local yield variation within the county that is associated with differences between nonmined prime farmland soil and all other soils that produce the reference crop.
- 8.) Under either procedure, the average reference crop yield may be adjusted, with the concurrence of the U.S. Soil Conservation Service, for disease, pest, and weather-induced seasonal variations, or, differences in specific management practices where the overall management practices of the crops being compared are equivalent.

Analysis:

A Prime Farmland determination was conducted for current surface disturbance areas in the current MRP. No modifications are necessary because no additional surface disturbance is anticipated with the addition of Federal Lease UTU-78562.

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Findings:

Information in the application is adequate to meet the requirements of the Reclamation Plan – Prime Farmland section of the regulations.

OPERATIONS IN ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 822; R645-302-324.

Minimum Regulatory Requirements:

This part sets forth additional requirements for surface coal mining and reclamation operations on or which affect alluvial valley floors in the arid and semiarid regions of the country.

Essential hydrologic functions

The operator of a surface coal mining and reclamation operation shall minimize disturbances to the hydrologic balance by preserving throughout the mining and reclamation process the essential hydrologic functions of an alluvial valley floor not within the permit area. The operator of a surface coal mining and reclamation operation shall minimize disturbances to the hydrologic balance within the permit area by reestablishing throughout the mining and reclamation process the essential hydrologic functions of alluvial valley floors.

Protection of agricultural activities

Surface coal mining and reclamation operations shall not: interrupt, discontinue, or preclude farming on alluvial valley floors; or, cause material damage to the quantity or quality of water in surface or underground water systems that supply alluvial valley floors.

The prohibitions of this section shall not apply:

- 1.) Where the premining land use of an alluvial valley floor is undeveloped rangeland which is not significant to farming;
- 2.) Where farming on the alluvial valley floor that would be affected by the surface coal mining operation is of such small acreage as to be of negligible impact on the farm's agricultural production;
- 3.) To any surface coal mining and reclamation operation that, in the year preceding August 3, 1977--
 - (i) Produced coal in commercial quantities and was located within or adjacent to an alluvial valley floor; or
 - (ii) Obtained specific permit approval by the State Division to conduct surface coal mining and reclamation operations within an alluvial valley floor; or
- 4.) To any land that is the subject of an application for renewal or revision of a permit issued pursuant to the Act which is an extension of the original permit, insofar as:
 - (i) The land was previously identified in a reclamation plan, and
 - (ii) The original permit area was excluded from the protection for reason set forth in this section.

Monitoring

A monitoring system shall be installed, maintained, and operated by the permittee on all alluvial valley floors during surface coal mining and reclamation operations and continued until all bonds are released. The monitoring system shall provide sufficient information to allow the Division to determine that:

- 1.) The essential hydrologic functions of alluvial valley floors are being preserved outside the permit area or reestablished within the permit area throughout the mining and reclamation process;
- 2.) Farming on lands protected under this section is not being interrupted, discontinued, or precluded; and
- 3.) The operation is not causing material damage to the quantity or quality of water in the surface or underground systems that supply alluvial valley floors.

Monitoring shall be conducted at adequate frequencies to indicate long-term trends that could affect compliance with this

section. All monitoring data collected and analyses thereof shall routinely be made available to the Division.

Analysis:

Essential Hydrologic Functions

It is highly unlikely mining will result in permanent damage to the Essential Hydrologic Functions of surface or groundwater discharge rates in the area surrounding Grassy Trail Creek. No surface disturbance will take place. Any detrimental affects caused by subsidence should only have a temporary localized effect on sediment yield due to the nature of steep mountain streams flowing on alluvial or soft bedrock sediments. Any additional monitoring and Protection of Agricultural activities are not anticipated.

Findings:

Information provided in the proposal is adequate to meet the requirements of the Reclamation Plan – Operations in Alluvial Valley Floors section of the regulations.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR 784.14; R645-301-730.

Minimum Regulatory Requirements:

The Division must provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area. The CHIA shall be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division may allow the applicant to submit data and analyses relevant to the CHIA with the permit application. An application for a permit revision shall be reviewed by the Division to determine whether a new or updated CHIA shall be required.

The Division has provided an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation, and all anticipated mining, upon surface- and ground-water systems in the cumulative impact area. The CHIA is sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division used data and analyses from several sources, including those submitted by the Permittee in the original West Ridge permit and information gathered at the Sunnyside Mines.

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